

Creative Leveraging of an LIS in the Sweetspot of an Integrated Healthcare Delivery System: Sutter Health

At a time when clinical quality, cost-effectiveness and healthcare automation have become daily news topics, inexplicably one of the most advanced sectors of healthcare has been largely ignored: the laboratory and its laboratory information system or LIS. With precision inherent in everything they do, it shouldn't be surprising that labs were one of the first hospital departments to use information technology to fully automate its processes, drive efficiencies and reduce costs. But it's the content the lab delivers that makes it critical to patient safety, quality of care, and speed to diagnosis.

Laboratory information constitutes as much as 65 percent of the content of the EHR and impacts 70 percent of clinical decision making—while accounting for only 3 percent to 4 percent of the total healthcare spend. Given the growing volume of lab tests, the LIS has become an indispensable solution for managing vast amounts of clinical information in a fast, accurate and integrated manner. Lab results are a matter of life or death for patients and without a highly functional LIS, effective treatment plans and protocols may be delayed or even lacking.

Sutter Health, a Sacramento, California-based integrated delivery network with 26 hospitals and numerous other facilities spread across northern California, offers a case study in how a large IDN conducts over 80 million tests annually using a remarkable distribution network across a wide and diverse region. The \$8.3-billion-a-year not-for-profit does this using a robust, best-of-suite LIS from Sunquest Information Systems Inc. that provides a standardized, common platform across the organization. In doing so, this state-of-the-art platform supports the vision of Ronald Workman, MD, Vice President of system laboratory services at Sutter—of the laboratory as a service line and revenue generator—not the traditional isolated hospital department and cost center.

Transformation of the lab and lab services is imperative to industry leaders like Workman, not only because the number of new lab tests and procedures has exploded but also because pathologists and other clinicians who interpret these ever-more complex tests must themselves become more active members of the patient's care team. The current economic environment has only accelerated this trend. A survey this year by "Clinical Lab News" found that a third of labs were forced to make budget cuts, half were leaving vacant positions open, four out of 10 instituted hiring freezes and more than half had deferred capital purchases. Clearly, care of patients is riding on IT-enabled productivity in the lab and the enterprise as a whole.

Spheres with a common language

Since Sutter processes 13-million lab tests annually across the three spheres of acute care, ambulatory care and referral lab services, an integrated, comprehensive LIS is imperative. "We integrate those spheres so orders and results flow," says Workman, a self-described "hybrid" with training in anatomic and clinical pathology as well as internal medicine. "We're interested in establishing testing standards to give patients an identical experience

as their clinical samples and records move among our sites. Interoperability and common test nomenclature are also important. The reason for this is to create an enterprise data warehouse of comprehensive lab information, which is a rich repository for clinical research,” he says.

IT standardization has been a top priority at Sutter for almost a decade, particularly in lab services, where the system has completed a standardized lab data base. “Physician and patient conversations are all centered around the same data set, so if the conversation has a common language we can improve processes and outcomes,” says Workman.

Sutter’s lab data flows from multiple sources like the northern California watershed it serves. Lab tests are performed at acute-care hospitals, multi-specialty clinics like the renowned Palo Alto Medical Foundation, a Sutter affiliate, and through community outreach involving storefront-like “draw clinics” to which physicians can refer patients for routine blood and urine tests. Sutter also uses commercial labs like LabCorp and Quest Diagnostics because those labs serve physician offices or physicians that may belong to an IPA contracting with the reference lab.

Sutter began using Sunquest in 1998 and it quickly became the dominant LIS among its affiliates, partly because the IDN, for reasons of cost and quality, wanted a robust common platform for lab data as it adds new hospitals and physician practices. That’s also true for its EHR, which is being standardized on EPIC. “Sutter continues to grow and will keep adding new campuses and draw clinics”, notes Workman. Also, since many Sutter affiliates found advantages in using Sunquest, it became the logical choice.

An enterprise-wide LIS

Today Sutter’s 26 hospitals have standardized their labs on Sunquest and all use the same analytics, test names and reference standards. “The belief was that Sunquest had momentum to become an industry leader. Changing an LIS is something you don’t take lightly. And you’ve got to make sure the vendor can grow with you and you with them,” he says.

One of the main benefits of a robust LIS is that it provides mission critical support for a large network like Sutter’s. “I’ve compared a multi-site LIS like ours to a freight train,” says Workman. “It has to haul lots of freight—information—cost-effectively over long distances. It’s got to be big and strong enough to haul your freight” and do so predictably in terms of uptime, redundancies and availability,” he says.

One of the biggest challenges is the C-suite’s perception that an LIS is merely a tool for clinicians to enter orders and receive lab-test results, like an automated subway-ticket machine. Instead, Workman argues, an LIS is essentially supporting an integrated delivery system—the lab service line—within the larger IDN. An LIS creates a platform for balancing out the resources of an organization, including allowing one lab to provide services to another. “Traditionally all hospital labs were full-service labs, but there’s a lot of redundancy,” he says. “It’s possible to provide a quarter to half of lab services for a

health system from a central location. An LIS also makes it possible to have a specialist in one location operate a lab process in another.

“You can theoretically operate a lab without any technologist on site—through automation and Internet protocols,” says Workman. “The skilled workforce is shrinking so dramatically. You’ve got to have a lab system that allows shared services. That’s way beyond just fulfilling an order.”

For example, in studying its lab service levels to the ER, Sutter found that in some cases its ERs were getting better service, when their lab sent a higher percentage of testing to the central lab instead their onsite lab. “Local processes can be so clogged up that they reduce service. So you really need a multi-site system, and then you can move non-urgent tests to the central lab. It gets into the notion of lab as a service line—not just a conduit to fulfill physician orders. It’s beyond the lab’s four walls,” he says.

David M. Robb, IS manager of Sutter’s laboratory application team, says an LIS enables a sprawling IDN like Sutter to manage a complex logistical flow of physical specimens for testing based on priority and the best particular lab to conduct the test. “It’s built into the software. You can map it to worksheets—it won’t let you send something to the wrong place,” he says.

A model for healthcare

The lab and LIS can provide a model for the rest of healthcare at a time when safety and quality depend on doing more with less.

“There will come a time when the EHR is not something where you have to manage its costs—it’s what you need to manage *your* costs. Today you have the costs of EHR rollout, adoption and workflow integration. That investment was made in the lab 20 years ago,” says Workman, “where the LIS became an essential infrastructure tool for managing the laboratory. It happened in the lab with the LIS; it hasn’t happened in the EHR yet—but it will.”

As a result, the cost of lab services as a percent of Medicare expenditures has dropped dramatically—from about 3% in the early 1990s to about 1.5%—over the last 15 years. A lot of the credit, according to Workman, goes to the automation of lab workflow by the LIS.

The LIS can also play a role in eliminating service duplication. A person with pneumonia, for example, may visit a doctor’s office and later an ER undergoing the same or slightly different lab tests. The LIS can prompt ER clinicians that the initial set of lab tests exists and therefore it would be unnecessary to run another set. “I’ve seen estimates that up to 25 percent of total lab costs in an episode of care have to do with lack of available information,” says Workman. “A best-of-suite LIS can help minimize that.”

Efficiency gains should ultimately help drive safer, better patient care—and more empowered patients, a goal for which lab information is foundational.

“The best thing that ever happened to the lab at Sutter Health is the advent of MySutter Online, which provides a web portal for patients to see their lab information,” Workman says. “Why is this remarkable? If you ask patients, lab results offer the objective information they can use to measure their health. It’s a source of truth that they never had before. This is the ultimate extension of the lab service line. My belief is the more informed a patient is, the more likely inclined they are take their medicine.”

City life

Take the two-hour drive from the Sutter Health offices in Sacramento in California’s vast Central Valley to California Pacific Medical Center (CPMC), a Sutter affiliate in downtown San Francisco, and you begin to get a sense of the enormous logistical challenge a regional health delivery organization like Sutter faces. It gets even more impressive when you arrive at the urban medical center.

CPMC alone fields nearly 1,400 beds spread among four campuses around San Francisco. Its sprawling central lab is located downtown on Buchanan Street where Lab Director Jennifer Schiffgens oversees lab services among CPMC’s campuses and a 350-doctor physician foundation (about 1,000 physicians are on staff). To handle the 28 million tests a year—which translate to five million “billables” or panels of tests—she manages a staff of more than 300, 200 of whom work in the central downtown lab. While CPMC posted more than 33,000 inpatient discharges last year, 60 percent of CPMC’s lab services are outreach or lab tests for patients referred by community physicians, supported by eight draw sites in the community. The remaining 40 percent is inpatient tests.

Given this scope, the LIS is indispensable and user training is of critical importance. “We take training here very seriously. It’s a passion of mine,” says Schiffgens. “All training has to be done prior to implementation because you can’t learn on a patient. The staff is so dependent on our LIS system,” she says.

Sunquest’s comprehensive LIS automates the process of ordering, tracking and managing lab tests, ensuring the “Five Rights of Laboratory Testing”®: the *right test* for the *right patient* at the *right time* based on the *right indicators* and *right diagnosis*. But it’s in specific applications that patient safety is upheld. Auto-verification software, for example, ensures that the bar-coded blood container from a blood bank is correctly cross-matched with the patient’s blood type, a tool that can be leveraged across a large, dispersed enterprise like Sutter. “You can help other affiliates with cross-matching because it’s all computerized, so they don’t need a registered blood bank specialist. You can centralize,” says Schiffgens.

Client Call Back is another LIS component that supports lab outreach by alerting lab staff to contact physicians regarding patient test results that require their doctor's attention. Such capabilities also bolster patient safety while enhancing customer service.

Big medical group, big test volume

About an hour's drive south of San Francisco in the heart of Silicon Valley is the Palo Alto Medical Foundation (PAMF), a 900-physician multi-specialty group that serves 600,000 people in four counties of the south bay. As director of PAMF's lab, Stephen Mascovich oversees one million billable tests annually, about half of which are performed onsite at the main lab, the remaining half are spread among seven lab satellites and Sutter's central lab.

"Labs are working on the same goals as the Foundation," he says. "Affordability of healthcare is a big goal while keeping physicians and patients satisfied."

PAMF's 120 lab employees at its various sites use the Sunquest LIS which is closely integrated with Sutter's EPIC core clinical information system. As soon as a physician enters an order for a test in EPIC it populates the Sunquest system too, so when the patient shows up at the lab's reception area, the information is immediately available and the patient can be shepherded to the phlebotomy unit, for example. In addition to general lab functions, the PAMF's LIS features tools for automatically identifying specimen containers and tracking them from collection to results reporting. Tracking is especially critical because around half the specimens are sent to Sutter's Shared Lab facility an hour-and-a-half east in Livermore.

"Our standardized approach to our LIS is a big improvement over any previous solutions," says Mascovich. "It makes it easy to look up information, data is readily available and it has the ability to track what happened to specimens, including who drew it, where and when it was done. Quality control tools make managing lab services much easier too. I don't know how we'd be able to function without the LIS. It would be virtually impossible."

Shared Lab

That's especially true given innovations like Sutter's Shared Lab, which functions like a large independent reference laboratory while maintaining Sutter's LIS/EHR connectivity and focus on patient care; it also makes complete economic sense. Sutter corporate uses several metrics throughout its labs to ensure prudent use of people and resources, including productivity, staff cost per test and supply cost per test. The Shared Lab keeps within the Sutter network a significant portion of the spending that would otherwise be going to the independent reference labs, improving the overall productivity of the system's lab workforce. And it does it less expensively because it eliminates third-party billing costs normally associated with independent reference labs.

Shared Lab is an 18,000-square-foot, state-of-the-art facility that is focused completely on performing tests sent by other Sutter facilities. Couriers deliver patient specimens to a

special entrance 24 hours a day seven days a week. Shared Lab performs tests that are difficult for a hospital lab to perform, including low-volume complex tests or high - volume tests that may not be cost-effective for a hospital lab to perform.

“It’s difficult to keep a reference lab in a hospital because of space and regulatory requirements,” says Michele Leonard, corporate director of clinical lab operations for Sutter. Shared Lab, which went live at the end of 2007, will perform about two million billable tests this year, including microbiology and molecular tests, of which the latter includes Chlamydia and HIV. The lab now offers 450 tests to Sutter affiliates, triple what it offered when it first opened. “We were sending a significant amount of referral tests outside the health system” says David Velasquez, director of Shared Lab. “it was a primary goal to bring that back,” he says. California’s stringent seismic regulations for hospitals also provided motivation for building a centralized lab facility like Shared Lab. “Many integrated health networks are beginning to look at standalone, off-site lab facilities,” Velasquez notes, adding, however, that only about 13 now exist across the country. As a result of the Shared Lab’s success, Sutter Health is looking at other shared in-house operations including pharmacy and food services.

Conclusion

Operating the lab service line at an integrated health delivery organization like Sutter Health is a job that addresses a vast array of clinical, scientific, logistical and business challenges. It combines the exactitude and precision of science with the distribution skill of a FedEx or UPS. With today’s lab services distributed among hospitals, storefronts, physician offices and large, standalone facilities, the LIS is indispensable for ensuring patient safety, clinical quality and organizational efficiency. As patients demand access to their lab results, and evolving esoteric testing helps transform the care delivery model into a more predictive and personalized process, the need for diagnostic IT will only grow.

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