Following industry best practices, Sutter Health radiologists routinely peer-reviewed 3% to 5% of all imaging reports to confirm findings or discover errors. The sample size, dictated by time limits, meant that up to 97% of radiology reports didn’t get the benefit of a double read.

Diagnostic imaging leadership at the integrated delivery network, which has 60,000 employees and 24 hospitals throughout northern California, believed they could greatly improve this retrospective process using artificial intelligence (AI). With the right AI partner, technology could read any and every report in minutes, not months, and improve care delivery.

Sutter Health’s Director of Imaging Informatics, Jason Wiesner, MD, easily decided its first AI-enabled use case would target lung cancer screenings. “For a health system trying to manage 3.5 million patients, lung cancer is a big problem. So, our plan was to do double reads to reduce quality gaps in lung cancer diagnoses,” said Wiesner, a full-time radiologist who also serves as one of 10 diagnostic-imaging, service-line medical directors at the health system.

A modern approach to improving patient safety

Sutter Health’s journey into AI began a year after its chief executives initiated a continuous improvement program known as Sutter Safe Care to improve patient and workplace safety at all of its facilities. This new emphasis led Wiesner to seek out an AI partner to strengthen the safety net surrounding diagnostic imaging – and not just at select campuses with ample resources; the same quality controls would eventually roll out to Sutter Health’s entire service area.

“Sutter Health launched this zero-harm initiative by saying, ‘We don’t care if you’re a patient at a clinic that serves farmworkers or you’re someone walking into a fancy San Francisco clinic for elective surgery.’ They wanted to ensure they delivered the same level of care to everyone,” said Pelu Tran, CEO of Ferrum Health, whose healthcare AI solution was chosen for the project.

The Ferrum platform, which operates as a healthcare AI hub, allows organizations to purchase, deploy, validate and support AI healthcare applications across clinical service lines and at an enterprise scale. In Sutter’s case, the company installed the AI infrastructure and management of multiple algorithms to create a Quality AI Hub and, more specifically, a Lung Health AI Hub.

A deeper look into lung screenings

According to the American Cancer Society, lung cancer is the second most common cancer, accounting for almost a quarter of all cancer deaths. This made deploying a dual algorithm that could read every CT scan of chest and lung tissues an...
understandable choice for Sutter’s first foray into AI. The technology would check every scan for pulmonary nodules while simultaneously using natural language processing to scan reports in which pulmonary nodules were not identified — and it would do this for 100% of studies, not just a select percentage.

In establishing a healthcare AI hub at Sutter Health, Ferrum staff installed servers on-premises at select pilot sites rather than in a hybrid cloud environment, per Sutter’s request. Ferrum staff then helped Sutter Health officials select, validate and deploy a chosen algorithm from a marketplace of both Ferrum-developed and third-party AI applications — in this case, CT lung nodules. Ferrum’s AI application portfolio also covers critical care areas, including neurological abnormalities, breast and liver lesions, pulmonary embolisms, aortic aneurysms, pneumothorax, trauma-induced fractures, hip alignments and knee osteoarthritis.

The implementation was seamless, with no disruptions to clinical or administrative workflows, according to Wiesner. “We were able to close that care gap within a number of hours using AI,” he said. “That was especially gratifying.”

Since its Sutter Health launch in August 2019, Ferrum’s AI platform has processed more than 212,500 patient records and found 1,234 instances (670 of them clinically significant) where pulmonary nodules were missed on the first read. “I think this quality check after the signed report is where we should be spending our time,” Wiesner said. “It allows us to make significant benefits to our patient populations — and, at the same time, allows us to learn about what AI actually means.”

In addition to better peer reviews, Wiesner views findings collectively as “peer learnings.” In looking at these 300 cases, radiologists realized that many overlooked pulmonary nodules were found in images that had been ordered for other areas of the body. The attending radiologist focused on one organ or area to the exclusion of another.

“It’s not that these radiologists are doing a poor job,” Tran explained. “Ninety-eight percent of the time, the scans are normal. To ask a radiologist to go from 98% to 99.9% accuracy is a difficult ask of them.”

Improving patient care quality for everyone

Today’s healthcare AI technology, Tran continued, is better equipped to bridge gaps in care and create greater health equity by providing the same level of service regardless of location. “You can’t launch a quality initiative in one institution and plop it into another one because workflows and training and resources are different,” he said. “But with technology, you can. We can monitor potentially missed lung cancers in the Central Valley or far northern California using the same tools being used on populations elsewhere — because technology doesn’t care where you are.”

Health equity is important at Sutter Health. “The COVID pandemic shone a light on the fact that every human should have the opportunity to attain their full health potential — whatever that looks like,” Wiesner pointed out. “And they should not be disadvantaged based on where they live or what social position they have.”

That commitment to consistent patient care extends beyond the initial detection by either a radiologist or an algorithm. Sutter is also tying its oncology service line to its AI initiative by building a systemwide program that quickly positions patient resources where needed. Nurse navigators take patient lists from imaging and reach out to assist patients in need, from setting up appointments to establishing transportation. “That human touch is vital, and this closes equity gaps by touching every patient at no charge,” he noted.

The power of AI partnerships

In addition to helping a large health organization fundamentally improve its lung cancer monitoring, Ferrum’s CEO believes the success at Sutter Health
You have to have a vendor who looks at the way your health system works, looks at what your priorities are, adapts their tools and meets you where you are.”

JASON WIESNER, MD | Director of Imaging Informatics | Sutter Health

“Your partnership with Ferrum has been unlike a traditional vendor relationship, and I think this is how health systems – and certainly ours – are going to be successful going forward,” the radiologist said. “You have to have a vendor who looks at the way your health system works, looks at what your priorities are, adapts their tools and meets you where you are. They’ve actually done that.”

Additionally, initiatives are underway to apply real-time, AI-enabled scans of fractures, 3D breast mammography and automated breast ultrasounds. Sutter Health also is looking at using AI to contain costs while improving health outcomes.

“We’re approaching a new world in which the only way you’re going to maintain your reimbursements, billing and pay rates is by taking a technology-first, scalable approach toward addressing a lot of patient quality issues,” Tran said.

With such promising initial results at pilot sites, Sutter is expanding use cases for this technology. In 2022, Sutter solidified plans to extend Ferrum’s AI platform to another life-threatening condition tied to diagnostic imaging: abdominal aortic aneurysms. Using an algorithm to double read radiology records should help prevent these ruptures, which require heroic efforts to keep patients alive.

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““Our health system is a big integrated delivery network, and we’re aggressively pursuing care-direct contracting and other value-based pay models,” Wiesner explained. “The way we’re going to survive in the future is by providing better care to patients, doing screenings and surveillance for things that can be treated, maybe electively, so the costs are lower and benefits to patient populations are greater.”

To learn more about Ferrum Health, visit ferrumhealth.com.

References

About Ferrum Health
Ferrum Health simplifies the use of artificial intelligence for health systems, providing an on-premises AI platform that integrates a validated catalog of AI applications from around the world. With Ferrum, health systems can easily implement, validate, and monitor a diverse ecosystem of AI applications. Ferrum’s Healthcare Al Hub ensures world-class patient safety technology is available for all patients, assisting hospitals in driving equitable outcomes for all their patients.