RAISING HEALTH WITH AI

In ways large and small, Northwell is using AI to reduce costs, ease employee burnout and improve patient care — and the work has only just begun

A child's drawing of a family looking at a doctor's back during a visit inspired physicians across the country to find ways to use technology — but keep patient care personal.

The back of the doctor's head: That's what many patients see during a consultation with their physician. A child's drawing that made the rounds in doctor's offices confirmed it, says Jason Naidich, MD, senior vice president and chief innovation officer at Northwell. "It showed a physician entering info into the child's electronic health record (EHR) while she and her family looked at his back," he says. "EHRs are fantastic. They can improve patient care, reduce costs and enhance patient safety — but as that child's drawing illustrated, no one likes how they reduce patient-doctor eye contact."

Enter a Northwell pilot program that uses artificial intelligence combined with an ambient listening device, much like Apple's Siri or Amazon's Alexa. The device transcribes the patient-doctor conversation into a note that goes directly into the EHR. "It saves an enormous amount of time for physicians and allows the doctor and patient to have a deeper human connection," Dr. Naidich says.

Ambient listening is just one example of how Northwell is harnessing the power of AI to improve the quality, safety and efficiency of health care. Last summer, Dr. Naidich spearheaded the launch of Northwell's AI Hub, in collaboration with Chief Digital Officer Kristin Myers and Rebecca Kaul, SVP of emerging technology. The AI Hub has five priorities: easing the administrative burden on clinicians, democratizing access to AI, reducing health care costs and improving both quality of care and access to it. "Tackling these five areas is already making a huge difference in the quality and efficiency of our health care. It's benefiting our clinicians, staff and patients," says Dr. Naidich.

Of course, using artificial intelligence in a clinical setting has its risks. Asked at a recent conference whether AI is friend or foe, Dr. Naidich responded that it's definitely a friend — but "kind of a new friend that you're not quite sure of." That's why keeping patient data safe and secure was the first and most essential condition for progress, Dr. Naidich says. Northwell's AI Hub is a secure environment within the organization's firewalls. And before it was inaugurated, Northwell gathered insight and direction from a multidisciplinary team that included medical and nursing leadership and experts from its legal, research, human resources, operations, intellectual property and ethics departments.

"In a methodical way, we are looking at AI to optimize its benefits and mitigate

"AI algorithms can search genetic data, genomic data and pathlogy data and every single clinical or research trial — all of it — to help us predict which chemotherapy is most likely to work for that specific patient." — JASON NAIDICH, MD

any risks," Dr. Naidich says. "We wanted to create a place where employees could use AI at work while making sure we had policies in place to keep it appropriate and ethical. And that's exactly what we've done. I'm very excited about the revolutionary ways AI is raising health at Northwell."

How the AI Hub works

Large language models are a type of artificial intelligence that use computing power to perform complex tasks thousands of times more quickly than a human could. These models learn from past queries, which means that their efforts improve at lightning speed as they search for previously undetected signals in massive data sets, create deliverables such as reports and automate labor-intensive calculations.

Since Northwell, like most hospital systems, has large volumes of data, using AI to help manage and organize it can save an enormous amount of time and effort. The hub gives employees access to 20 large language models — including OpenAI's ChatGPT, Claude from Anthropic and Google's Gemini — and to a task library, a repository for the applications Northwell AI experts and employees have created. Employees can solve a challenge by clicking on an existing task or creating their own — and then rate how well each AI solution worked, making it easy for other users to see which applications in the task library are most useful and popular.

Streamlining operations and reducing administrative burden

The thoughtful design of the hub is doing a good job of making AI easy and accessible. Just six months after it launched, it had 12,000 users, from administrative staff to vice presidents and above. And it's having a far-reaching effect. "It's like everyone has their own powerful executive assistant," Dr. Naidich says.

That's a huge win in a high-stress era in health care. Staff and clinicians are overworked and burdened — in fact, a 2024 American Medical Association survey found that nearly half of all physicians report symptoms of burnout and stress. Using AI to handle administrative work can help doctors, nurses and other clinicians spend more time doing the things that they are best at, Dr. Naidich says. "It allows them to focus on the human element of care."

Boosting quality, reducing costs

A hospital's readmission rate is among its most important metrics — it's one of the key numbers the U.S. Centers for Medicare & Medicaid Services reviews

when assessing quality. Keeping the readmission rate as low as possible is also an important way to reduce costs and make health care more accessible.

AI is helping Northwell take a patient-centered approach to reducing readmission rates, Dr. Naidich says. For instance, the system's Health Solutions team, which manages patients who have multiple, chronic comorbidities, uses AI to identify patients who are at the greatest risk of readmission within 30 days — such as patients with heart failure or chronic obstructive pulmonary disease (COPD) — so team members can execute targeted,

one-on-one interventions. That kind of close management helps ensure these high-risk patients are following discharge treatment plans and allows the team to quickly address any issues that emerge.

Providing such immersive care would be prohibitively expensive for an entire hospital population — and unnecessary, Dr. Naidich says. "By focusing on this smaller group of high-risk patients, in one pilot study, the system decreased the 30-day hospital readmission rate by an amazing 21%." This study found that augmenting an existing transition of care navigation program with patient insights from AI reduced rehospitalization more than the program without AI insights.

Another application that uses an algorithm to optimize operating room schedules has helped Northwell increase its surgical capacity by 6%. "We can serve more patients in the same number of operating rooms," Dr. Naidich says. "These kinds of complex scheduling challenges used to require lots of time from humans. AI does it better and more cheaply."

A helpful backstop

While the AI Hub works behind the scenes to streamline operations, team members also use applications to help with clinical decision making. "It's important to make clear that this is an aid, not a replacement for human judgment," Dr. Naidich says. "We're very careful about AI when it comes to patients, and we only use clinical applications approved by the Food and Drug Administration."

"We've only just scratched the surface of how AI can help us improve efficiency and deliver cutting-edge care for our patients"

— Jason Naidich, MD

One of the earliest projects leveraged AI to assist in the diagnosis of CT scans, MRIs and X-rays. "The first trials were focused on using AI to help find pulmonary emboli, giving doctors a second set of eyes," Dr. Naidich says.

That isn't to say the first set of eyes — the physicians — weren't already doing remarkably well. AI proved most helpful for trainees who were looking at an image before the attending physician, or for generalists who were looking at it in the middle of the night. "It was less that we were missing cases than that we had an opportunity to expedite diagnosis, including in emergency situations," Dr. Naidich says.

Now, AI runs in the background whenever a chest image is taken; it's looking for emboli and pushing positive images up in the virtual queue so that they get in front of human eyes more quickly. And if there's a discrepancy between the findings of AI and those of a clinician, the latter gets the final word.

"We put an adjudication process in place, so that the chief of our division of pulmonary radiology and a few of our most senior chest radiologists review all discrepancies. If there is a disagreement, we have the most knowledgeable experts in our system to help decide what to do with the patient," Dr. Naidich says.

AI is also being used in cases of suspected stroke. As is standard practice, these patients get a non-contrast CT scan of their head and advanced imaging such as CT angiography and perfusion; but now, AI helps flag those who are a candidate for endovascular thrombectomy. "That means we can get the call team into the hospital faster," Dr. Naidich says.

These early successes have paved the way toward greater use. Northwell now also uses AI to aid in detection of aneurysms, fractures, and other emergent conditions.

The future of AI at Northwell

Artificial intelligence is only going to keep improving care at Northwell, Dr. Naidich says. "I think of artificial intelligence as a copilot. Our experience has been that humans — administrators or physicians or anyone on staff — who use AI are better than humans alone or AI alone."

Dr. Naidich expects users of the AI Hub will continue to find new ways to increase efficiency and quality. Meanwhile, researchers at Northwell's Feinstein Institutes for Medical Research are harnessing AI as they develop new tools to improve patient outcomes. For example, Dr. Naidich points to Theo Zanos, PhD, who leads the Division of Health Artificial Intelligence at the Feinstein Institutes, where he successfully developed and tested an algorithm that uses AI to proactively identify patients at risk of sepsis and early deterioration across the Northwell Health system.

"This and other research play a critical role in ensuring that AI tools used by clinicians are trustworthy, equitable and maintain accuracy as they continue to learn and evolve," Dr. Naidich says.

He believes AI may usher in a new era of precision medicine. Being able to handle massive data sets far bigger than a human can manage is one of AI's greatest strengths, he says. "It's going to improve our ability to see what drugs are working in cancer patients, for example. Today there are generalized protocols to treat these patients based on population-wide statistics, but AI algorithms can search genetic data, genomic data, pathology data and every single clinical or research trial — all of it — to help us predict which chemotherapy is most likely to work for that specific patient."

What comes next? "Northwell has a strong culture of innovation and we've been early adopters in many, many ways," Dr. Naidich says. "The future is very bright. We've only just scratched the surface of how AI can help us deliver cutting-edge care for our patients."