



## Tools of the Trade

# AI Advancements in Healthcare

Physicians are using technology for everything from improving patient care to helping with menial tasks

BY ILENE OLSON



Michael Hill, MD, poses with the Da Vinci robotic surgery unit that was recently acquired by the North Big Horn Hospital in Lovell. Dr. Hill, now a surgeon at the Lovell hospital, began performing robotic surgery in Billings, Montana, in 2017. COURTESY NORTH BIG HORN HOSPITAL

**A**rtificial intelligence and other technological advances are changing the world around us, while expanding the possibilities we see and expect.

Technological innovations in the medical field are prime examples of those changes and advancements, enhancing physicians' ability to care for their patients and improving patient outcomes. Many of those advancements aim at reducing the administrative burden in hospitals and clinics, while others improve practitioners' ability to diagnose and treat their patients.

The American Medical Association uses different wording and visualization for AI.

"We talk about augmented intelligence versus artificial intelligence," said Margaret Lozovatsky, MD, the AMA's new vice president of digital health innovations, during an AMA podcast interview with Todd Unger, AMA chief experience officer on Feb. 6.

"What we need to understand is that the technology is not going to diagnose the patient," Lozovatsky continued. "The technology is going to help us in our day-to-day work to be able to do what we love, which is practice medicine."

Lozovatsky, a pediatrician who also has a computer science

degree, said cross-training in both of those fields provides a unique perspective that has allowed her to serve as a liaison between technology teams and clinicians.

"Having that physician voice in how the technology is implemented is absolutely critical," she said.

She noted that the AMA promoted a playbook for telehealth years ago.

"Now, of course, telehealth has evolved to really move into the entire digital health spectrum," she said.

### Mobile clinics use telehealth

Cheyenne's HealthWorks utilizes telehealth technology routinely to take medical care to all three of the city's junior high schools, Alta Head Start, the senior center, the Boys & Girls Club, and more.

"Our mobile clinics can go to where the people are," Monica Jennings Woodard, operations director for HealthWorks said in August. "We were the provider for the Senior Olympics [and] Pride Weekend downtown."

Through its mobile clinics and technology, HealthWorks offers every service that is available at its main clinic. That is achieved through iPads, laptops, and phones in the mobile



Monica Jennings Woodard, operations director for Healthworks in Cheyenne, stands near mobile clinics used to provide medical services to the Cheyenne community. PHOTO BY ILENE OLSON

units. “We can use that to be able to communicate with our team here,” she said. “If we need to communicate with each other about non-patient issues, we can use Microsoft Teams to talk to each other.”

Each mobile unit has lab equipment, a printer and everything else needed to care for patients. The mobile clinics also are wheelchair accessible, she said.

If a student needs to be seen and has a consent form, providers in the mobile clinics can care for the child and include the child’s parents at work or home in the visit through a secure HIPAA-compliant telehealth program, Jennings Woodard said.

“We meet you where you are,” she said.

## Augmented intelligence in medicine

As augmented intelligence becomes more advanced and available, Dr. Lozovatsky said she envisions it being instrumental in synthesizing and bringing data to physicians, which would allow them to spend more time face-to-face with their patients and less time staring at a computer.

Donald Kirk, MD, of Star Valley Health, uses a note-taking program, Dragon Ambient eXperience, or DAX Copilot, for that reason.

Dragon, a well-known voice-recognition program, was acquired by Microsoft from Nuance in 2022.

Before that, DAX recordings were listened to by Nuance employees, who cleaned up the information and put it into

notes within 24 hours, Dr. Kirk said in a July interview.

“DAX ... no longer has a human element,” he said. “It populates a note pretty much when I’m done.”

Dr. Kirk and two other physicians at Star Valley Health began using DAX in June. He said he finds it helpful, even though he must read through and correct every note the program constructs.

The other two doctors, who are family medicine providers, decided not to continue with the notetaker program for now because it is easier for them to use their templates. Those are generally sufficient and faster than using DAX and editing the notes afterward.

Dr. Kirk, who also serves as Chief Medical Officer for Star Valley Health, said he finds it helpful, and, “I’m more invested in trying to make this successful for this institution. I’m more interested in the future and happy to deal with some of the shortcomings at this time. It’s definitely made a difference for me.”

Human scribes can be helpful, but it takes three to six months to fully train them. And after six months, they’re often considering other career options, he said.

“There aren’t a lot of people in high school going, ‘Hey, I think I want to be a scribe for the rest of my life,’ he said.

“Humans get sick, need or want time off,” he said. While those absences are usually appropriate and to be expected, they are also inconvenient.

Another option is using virtual scribes, “where you’re outsourced most of the time to folks overseas where they’re listening in, and there have been issues with that,” Dr. Kirk added.

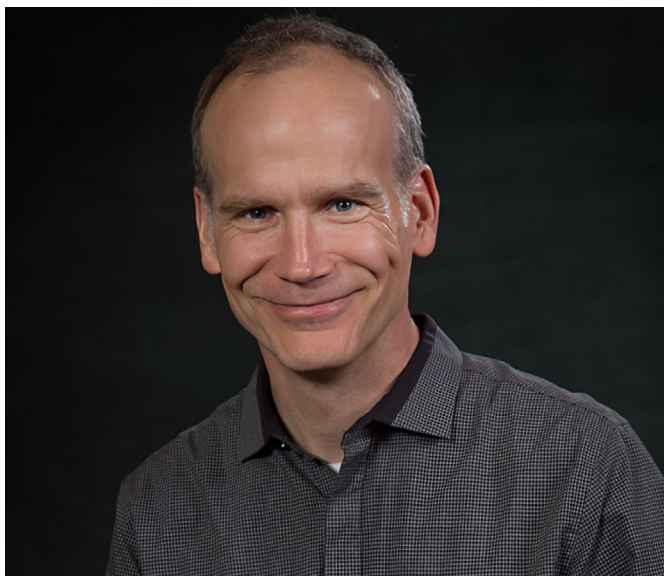


A look at the exam room space inside a HealthWorks mobile clinic. PHOTO BY ILENE OLSON





## Tools of the Trade



Donald Kirk, MD, has used the Dragon Ambient eXperience (DAX) note-taking program since June. PHOTO COURTESY OF STAR VALLEY HEALTH

“Basically, DAX is an artificial intelligence scribe that doesn’t want time off, and it isn’t looking for career advancement” he said.

“As long as it’s recording the information, I can parse it out later. I feel like I can spend more time with the patient and less time charting,” he said. “I’ve figured out how to utilize what it can give me and not worry about some of the other issues. ... That said, it’s making a lot of mistakes right now.”

For instance, when a patient was constipated, Dr. Kirk recommended using a colonoscopy bowel prep to relieve the constipation.

“DAX said I ordered a colonoscopy. I didn’t — just the bowel prep. If I don’t read it [the note transcribed by DAX], if I don’t look through it, it will have mistakes like that.”

Despite the need to read through and correct the notes, “it still helps me speed things up,” Dr. Kirk said.

Before he begins notetaking with DAX, Dr. Kirk talks to his patients about the program and asks their permission to record their visit. He has developed an information sheet about the program that his staff gives to his patients before he sees them. In the rare cases when a patient declines, he takes notes himself.

After permission is given, Dr. Kirk opens an app called Haiku and the recording begins, preceded by a prompt to make sure the patient has agreed to being recorded.

When the visit is over, he hits the microphone on the app and

it stops recording.

When he’s back in his office, Dr. Kirk hits the microphone again and makes any additions needed to the notes.

“Within about 10 seconds, it’s got everything in the chart,” he said. DAX omits any part of the conversation that is not related to the medical issues discussed during the visit. “It definitely cuts out any unnecessary information,” he said.

An addition can be made within two hours, but is not possible to add to the notes after any editing has taken place, he said. “If I do any editing, you’re done.”

Dr. Kirk said DAX is reportedly able to separate the voices of 10 different people in a room. While he has never had that many people in a clinical visit at one time, DAX reliably differentiates between people during medical appointments. For instance, the program will note, “Mom says patient has been throwing up. Patient says he had a headache.”

More refinement is needed in the program, Dr. Kirk said.

“One of the issues I’ve had is it’s trying to write a term paper, be a Chat GPT, as compared to a provider who does clinic notes,” he said. “In very rich prose, it said, ‘The patient denies eating causes pain. The patient denies drinking soda causes pain.’ It went on to say four or five things that the patient denies what causes pain. A provider would say those all together.”

A pending update will have an option for bulleted or outlined clinic notes, he said.

Dr. Kirk said that update and other planned upgrades for the DAX software should make the notetaker program more efficient and useful. Among them is a planned reminder function that would prompt providers to follow through on things they discuss with patients. For instance, if a physician said he would order a CBC and a blood chemistry panel in nine months, DAX would remind the provider at that time.

There are cautions to consider, however.

“Can it fail? Yeah. Do you need to be ready for that? Yeah,” he said.

For example, one day when Dr. Kirk sat down to finish some notes recorded a couple of weeks earlier, he hit the button to generate a note about a patient with a complex history, and there wasn’t anything there.

“Thankfully, I remembered it pretty well,” he said.

As with any electronic health information, security is imperative.

“One of the initiatives our hospital is working on is being prepared in case of a cyberattack. We have to be ready for so many reasons. From my perspective, with Microsoft being a major player [with DAX], I’ve got to feel like security would be better than it would be with a smaller player.”

According to an August 2023 AMA survey of physicians about



## Tools of the Trade

augmented intelligence and its assistive role in healthcare, only 14 percent of doctors were using AI tools to create discharge instructions, care plans or progress notes at that time.

### AMA survey results

In a December 14 press release, the AMA summarized the survey results as follows:

- 41% of physicians were equally excited and concerned about AI in healthcare. Enthusiasm was highest for AI tools that help reduce administrative burdens, including documentation (54%), and prior authorization (48%).
- AI tools were most helpful for enhancing diagnostic ability (72%), workflow efficiency (69%), and clinical outcomes (61%).
- Concern was highest for AI tools that impact the patient-physician relationship (39%) and patient privacy (41%).
- The top attributes required to advance physician adoption of AI tools were data privacy assurances (87%) and not being held liable for AI model errors (87%).
- AI tools were in use by 38% of physicians with the most common uses including creation of discharge instructions, care plans or progress notes (14%); documentation of billing codes, medical charts or visit notes (13%); translation services (11%); and assistive diagnosis (11%).
- Transparency is key for AI tools, with about 80% of physicians indicating they want clear information about key characteristics and features regarding the design, development and deployment of AI tools.

### Robotic surgery

One of the biggest technological advances in medicine is the advent of robotic surgery, which allows surgeons easier access to small spaces in a patient's body, reduces post-surgical pain and improves patient outcomes.

Rebecca Deal, MD, a surgeon at Cody Regional Health, said robotic surgery is an advanced form of laparoscopic surgery, with even smaller incisions and greater dexterity. Dr. Deal performs surgery with a Da Vinci robotic surgical system like the ones she used in her residency and at her previous job in Littleton, Colorado.

"The robot can rotate just like a wrist, as opposed to a straight chopstick-like operation as in laparoscopic surgery," she

said. It adds full articulation, which allows us to have similar dexterity to our hands while we're inside a patient — and that is huge," Dr. Deal said.

The Da Vinci System has all the tools you would have for laparoscopic surgery — graspers, stapling devices, scissors, needle drivers — "anything you want for any type of case," Dr. Deal said.

In addition, it has a much better camera that allows surgeons to see everything during the surgery in 3D, she said.

Dr. Deal said robotic surgery is especially helpful in repairing hernias, because they are in confined spaces.

"A lot of surgeons struggle to close the fascia in the abdominal wall," she said. "It is difficult to do in laparoscopic surgery. With robotic surgery, you can close the inside of a patient without as much difficulty. It makes us much faster, and patients are on the operating table for less time. It's all done through tiny



Rebecca Deal, MD, performs robotic surgery on a patient at Cody Regional Health, using a Da Vinci robotic surgery system. The Cody hospital began offering robotic surgery in June. COURTESY OF CODY REGIONAL HEALTH

incisions."

Dr. Deal said it takes some time to be proficient with robotic surgery, but with experience, it gets much faster.

"I think you need at least 20 cases to really feel comfortable," she said. "You get good, then you get fast. ... I can do a bilateral hernia in 30 minutes."

Surgeons with advanced laparoscopic experience tend to pick up robotic surgery faster, Dr. Deal said.

She cited the example of Thomas Etter, DO, who helped lead





## Tools of the Trade



Rebecca Deal, MD, says performing surgery with a Da Vinci robotic surgical system is a "huge improvement."  
COURTESY OF CODY REGIONAL HEALTH

the effort to acquire a Da Vinci robotic surgery system for Cody Regional Health.

"He's doing all sorts of advanced stuff," she said. "He had so many years of advanced laparoscopy, he just jumped on it and adopted it."

Forty-five miles away in Lovell, at North Big Horn Hospital (NBHH), Michael Hill, MD, also uses a robotic surgery system. He previously used a Da Vinci robotic surgery system at Billings Clinic in Billings, Montana, beginning in 2017.

Dr. Hill performed traditional laparoscopic surgeries at North Big Horn Hospital on a contract basis, beginning in 2016, while employed at Billings Clinic. He moved to Lovell and began working full time at NBHH in 2022. The recent acquisition of a robotic surgery system there allowed him to perform robotic-assisted surgery at the Lovell hospital.

Dr. Hill said the robotic arm's ability to articulate its movements is a huge improvement over laparoscopic surgery.

"If I have a straight stick going into a patient's abdomen, all the torque of that instrument is going into the patient's abdominal wall," he said. "With robotic-assisted surgery, there is no transference of energy or pressure into the patient's abdominal wall."

That results in less trauma to the patient's tissues, less blood loss, less pain, faster recovery, and shorter hospital stays, he said.

"Normally, after a hernia surgery, a patient goes home with 10 days of prescription-strength medication. Now, they often go home on Tylenol," he said, adding, "The biggest thing for me is

the reduced need for prescription-strength pain medications."

Dr. Hill also explained some other advantages of robotic surgery.

"If I'm taking out colon cancer, the thing I'm worried about is the ureter. Will I be able to see where the ureter is, and prevent injuring something you don't want to injure?"

The robotic surgery system is designed to work with indocyanine green, or ICG, a chemical dye that the robotic camera picks up, though it can't be seen with the naked eye. It highlights different things in a patient, depending on how and when it is administered. If administered through a catheter, it highlights the ureters; administering it intravenously an hour before surgery makes the bile ducts glow, Dr. Hill said.

"If all that anatomy glows, you can see the anatomy of the bile ducts," he said. "Even before you start dissecting, it will show you where the anatomy is. It protects you from injuring structures."

A surgeon needs to be able to determine exactly where colon cancer ends and healthy tissue begins, ensuring that the remaining tissue is healthy after the cancer is removed, he said.

"You know you put healthy pieces of colon back together. It helps me sleep at night," knowing the risk of anastomotic breakdown has been minimized, he said.

A planned software upgrade to the robotic surgical system will install an AI component that will overlay information from a patient's CT scan into the surgeon's console. The overlay will precisely identify the patient's anatomy and provide other important information for the surgeon, Dr. Hill said.

For example, when a surgeon is removing a cancer from any organ, "it will be able to highlight where the cancer is, so that the surgeon can allow a margin around that cancer," he said.

Both Dr. Hill and Dr. Deal said it is often difficult for patients to wrap their minds around how robotic-assisted surgery works.

"It's hard for patients to grasp," Dr. Hill said.

When Cody Regional Health introduced its Da Vinci System to the public, an ad campaign named it "Leo." While that was a good attention-grabber, Dr. Deal said it gives some people the impression that the robot is doing the surgery independently. She assures them that's not the case.

"I tell them, 'I am in your room; I am at your bedside. It is only listening to my inputs and my movements.'"

A video showing Cody Regional Health's Da Vinci System can be viewed at [https://www.youtube.com/watch?v=\\_EtAWWX1Tbg/](https://www.youtube.com/watch?v=_EtAWWX1Tbg/).

*The American Medical Association does not endorse any brand of AI technical advances or medical equipment.* 