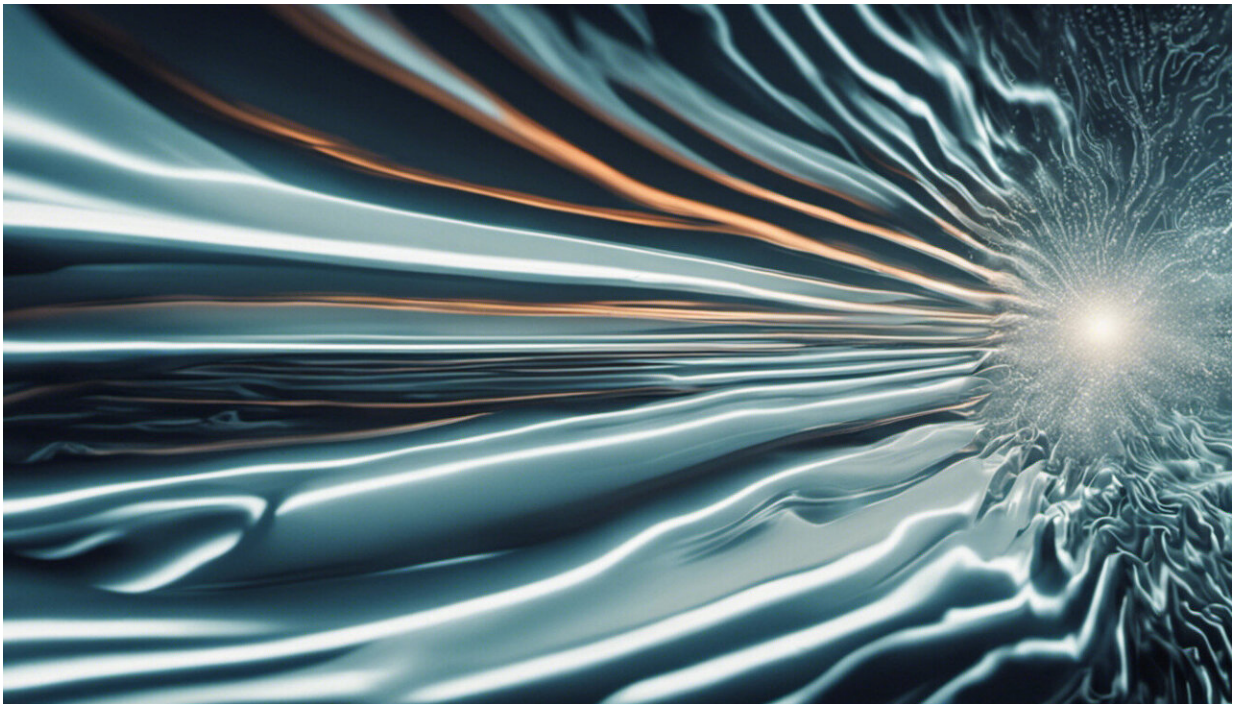# Artificial intelligence improves colonoscopy accuracy

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Credit: AI-generated image (disclaimer)

James East, M.D., spends his days skillfully examining people's colons, searching for and snaring away suspicious polyps that might one day turn into cancer. A gastroenterologist at Mayo Clinic Healthcare in London, he says the ability to identify cancer risks and eliminate them on the spot during a colonoscopy is one of the most satisfying parts of his chosen

profession.

Colonoscopy remains the gold standard in detecting and preventing colorectal cancer. But the procedure has limitations. Some studies suggest that more than half of post-colonoscopy colon cancer cases arise from lesions that were missed at patients' previous colonoscopies.

Now researchers at Mayo Clinic are investigating how artificial intelligence can be harnessed to increase polyp detection. In fact, gastroenterologists are engaging AI as a tool to improve care for a wide range of conditions, with the goal of finding elusive signs earlier when the diseases are more treatable.

In the case of colon cancer, the AI system works alongside the physician in real time, scanning the colonoscopy video feed and drawing small, red boxes around polyps that might otherwise get overlooked.

"We're all familiar with facial recognition software," Dr. East says. "Instead of training the AI to recognize faces, we train it to recognize polyps."

Artificial intelligence can be added to a traditional colonoscopy to identify polyps that otherwise might be overlooked.

Colon cancer is the second deadliest cancer worldwide. The past few decades have seen a steady rise in colorectal cancer rates among younger people. While colonoscopy can be an effective screening tool, Dr. East says there is variability in how well endoscopists find precancerous polyps.

Ironically, polyps are hardest to spot in patients who are most in need of screening. Patients with inflammatory bowel diseases such as Crohn's disease or ulcerative colitis are at high risk of colorectal cancer. But the

pre-cancerous lesions they develop tend to be flat or only slightly raised, unlike the bulbous mushroom-shaped polyps seen in people without IBD.

"Most people that develop these cancers are undergoing regular colonoscopies, and the lesions still get missed because the tumors are very subtle," says Nayantara Coelho-Prabhu, M.B.B.S., a gastroenterologist at Mayo Clinic in Rochester, Minnesota.

Dr. Coelho-Prabhu believes that AI could be trained to track down deceptively innocuous-looking polyps.

"Mayo Clinic is uniquely poised to take on this type of research," she adds. "We conduct surveillance colonoscopies in 800 to 900 IBD patients a year. As a result, we have accumulated a huge databank we can use to develop the AI systems needed to improve how we do colonoscopies for these patients."

That databank provides what Dr. Coelho-Prabhu and other experts call "ground truth," the real-world observations and measurements used to train and test AI algorithms. Her team is currently annotating data from a subset of 1,000 patients, watching one colonoscopy video after another and marking lesions in every frame, from every angle. After the images are annotated, the researchers will feed them to a computer to generate the type of AI "machine learning" algorithms that enable the machine to learn how to recognize IBD-specific polyps on its own.

Dr. Coelho-Prabhu, gastroenterologist Cadman Leggett, M.D., and colleagues are pioneering a new digital endoscopy platform that will film all in-house procedures, correlate them with medical records, and then integrate AI back into the procedures as applicable.

"Once we develop algorithms, we can run them in our procedure videos to test their performance," she says.