

AI trained to detect hard to spot cancerous lesions in colon

November 1 2022



Credit: Pixabay/CC0 Public Domain

An artificial intelligence (AI) tool, developed by scientists at UCL, UCLH and UCL-spinout Odin Vision, has been further refined to identify hard to spot "flat" polyps, that—when left untreated—can become highly aggressive and are a major cause of colorectal (bowel)

cancer.

For the study, published last year in *Digestive Endoscopy*, the research team trained the AI in Odin Vision's CADDIE system on these flat polyps. CADDIE uses AI during an endoscopy to detect and characterize [adenomatous polyps](#) (AP) in real-time. APs are more common and have distinctive tubular features with the growth resembling a mushroom, attached to the colon by a thin stalk.

In comparison, flat polyps—including flat lesions and sessile serrated lesions (SSLs), known as "subtle advanced neoplasia"—have far fewer distinctive features and are notoriously difficult to detect. They are also more likely to develop into an [aggressive cancer](#), meaning it will spread or grow quickly.

To overcome this, researchers upgraded the CADDIE AI algorithm and created four video test datasets, containing images of 173 polyps (consisting of more than 670,000 individual frames), that included a dataset of the most challenging flat polyps.

In the challenging dataset, the algorithm detected a significantly higher percentage of the flat polyps when compared to expert and trainee colonoscopists, at 79.5% versus 37% and 11.5% respectively.

The AI also detected flat polyps at a faster rate and across the other datasets the algorithm detected nearly 100% of polyps.

Researchers say the enhanced AI will help to detect significantly more of the subtle advanced neoplasia group, helping to reduce colorectal (cancer of the colon or rectum, or [bowel cancer](#)) cancer—the second leading cause of cancer deaths in the UK after lung cancer.

The CADDIE system, now upgraded, is being used in several NHS

hospitals, including UCLH, along with many private hospitals.

Senior author Professor Laurence Lovat (UCL Surgery & Interventional Science) said, "Polyps that are flat, or depressed, are far harder to spot until they are quite large, and the data shows they are more likely to be aggressive."

"Refining the AI is a significant step forward in the early detection of colorectal cancer and will lead to lower rates of missed cancers and vastly improve our capability to save lives."

Lead author Dr. Omer Ahmad (Wellcome / EPSRC Center for Interventional & Surgical Sciences, UCL) said, "We spent considerable time working with expert colonoscopists to develop the video dataset of extremely challenging polyps that could easily have been missed."

"These polyps were incredibly subtle in appearance and highlight the importance of developing novel technologies to assist colonoscopists during the procedure and improve detection rates."

"We hope that this major system upgrade will support clinicians in the fight against this common cancer, which is set to become more prevalent over the next few years."

Co-author Juana González-Bueno (Research Scientist, Odin Vision) added, "It was encouraging to see that AI can double the expert detection rate for these polyps. More importantly, it can increase the detection rate of less experienced colonoscopists by a factor of seven. Overall, the implications are great as it enables all colonoscopist experience levels to surpass expert polyp detection rates."

Colorectal cancer and detection of polyps

Colorectal cancer is the fourth most common cancer in the UK, with over 41,000 new cases diagnosed each year and around 268,000 people living with the condition.

There are around 16,800 colorectal cancer-related deaths in the UK each year, and this is predicted to increase by 51% over the next 15 years and become more widespread in people under 50.

Colonoscopy is the accepted global gold standard for screening of [colorectal cancer](#) (CRC) and most CRCs develop from APs.

During a colonoscopy, a thin pipe with a camera attached is inserted into the bowel, allowing clinicians to view the inner lining and look for anomalies such as APs and flat polyps.

When a polyp is discovered, they are usually removed with surgery the same day.

While expert-level colonoscopists have very good adenoma detection rates (ADR), levels vary greatly between hospitals. It is estimated 25% of [polyps](#) are missed during colonoscopy; with each one percent increase in the ADR correlating to a three percent decrease in the risk of [cancer](#).

More information: Omer F. Ahmad et al, Performance of artificial intelligence for detection of subtle and advanced colorectal neoplasia, *Digestive Endoscopy* (2021). [DOI: 10.1111/den.14187](https://doi.org/10.1111/den.14187)

Provided by University College London

Citation: AI trained to detect hard to spot cancerous lesions in colon (2022, November 1) retrieved 26 March 2023 from <https://medicalxpress.com/news/2022-11-ai-hard-cancerous->

[lesions-colon.html](#)

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.