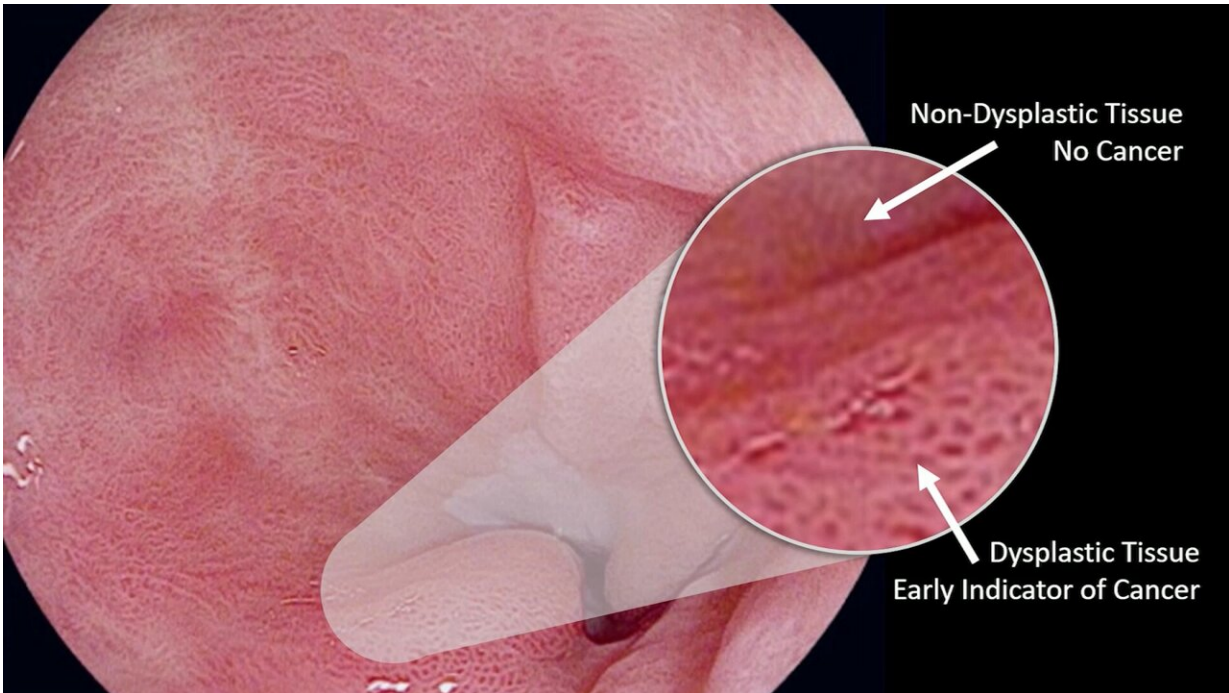# Detecting oesophageal cancer with AI

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Credit: Odin Vision

Experts at UCL and spinout company Odin Vision working with clinicians at UCLH have used artificial intelligence (AI) to help detect early signs of oesophageal cancer.

The first procedure in the world using the AI technology was performed at University College Hospital by UCLH consultant gastroenterologist Dr. Rehan Haidry. The system, called CADU, uses AI to support doctors

in identifying cancerous tissue.

CADU achieved regulatory approval at the start of 2021 making it the first medical device using AI for oesophageal cancer to be CE and UKCA approved for use on patients.

It has been developed in collaboration with UCL scientists, including Dr. Haidry, who is also Associate Professor at UCL, and Odin Vision, a spinout formed out of the research and innovation work at the UCL Wellcome / EPSRC Centre for Interventional and Surgical Sciences.

Early signs of oesophageal cancer are difficult to diagnose. It has a five-year survival rate of less than 20% and is one of the six less survivable cancers. The cancer forms in the esophagus, which runs from the bottom of the throat to the stomach. Studies have shown that up to 25% of early cancers in the esophagus are missed during endoscopy procedures.

To diagnose this cancer, a doctor will typically use a small video camera to look inside the patient's throat for the early signs of the disease. Doctors are looking for subtle changes in the color and pattern of tissue, but these can be incredibly hard to spot. The patient is usually awake during the procedure and is often given mild medication to numb the throat.

The CADU artificial intelligence system has been shown hundreds of thousands of images of diseased tissue and has learned to classify tissue using the visual patterns in images. During the endoscopy procedure, CADU analyzes the image from the video camera in real time and provides information about the visual characteristics of the tissue, supporting doctors in their inspection of the esophagus. If detected early, the disease can be eradicated over 90% of the time with a less invasive procedure.

Peter Mountney, Odin Vision CEO and Honorary Associate Professor, UCL Computer Science, says that "AI has great potential to transform healthcare. We are very excited to achieve this landmark procedure and use our AI technology to support doctors in the fight against one of the most aggressive forms of cancer."

Dr. Haidry, who has been working closely with Odin Vision on developing this innovative platform, explains that "oesophageal cancer remains a very big challenge for us and carries a very high mortality compared to other solid organ cancers. It is imperative that we can detect changes early when we carry out routine endoscopic examinations, because we are now in an era where we can deliver early curative treatment that can improve the outlook for patients with oesophageal cancer."

"Despite the fantastic development of imaging and training there is still room for improvement and the new CADU system will allow us to improve early detection and streamline the care for these patients across the country. It has been a huge privilege to be working with the great team at Odin Vision on this project and I am very excited to finally see it being used in routine clinical care on our patients and in our endoscopy unit at UCLH."

Professor Danail Stoyanov, Director of the Wellcome/EPSRC Centre for Interventional and Surgical Sciences (WEISS) at UCL and founder of Odin Vision said. "It is fantastic to see UCL and Odin's pioneering research translate into a clinical product that can start supporting doctors and helping patients today."

Professor David Price, UCL Vice-Provost (Research, Innovation & Global Engagement) says that after being "founded by a team of UCL clinicians, medical imaging and AI experts, UCL spinout Odin Vision has the ability to dramatically improve the early detection and diagnosis

of oesophageal cancer, leading to early treatment and lives saved. This is a shining example of how UCL translates its world-leading research into practical applications to fight serious and challenging diseases to save lives globally."

Jenny Thomas, Programme Director for DigitalHealth.London, says that "this first use of Odin Vision's technology in oesophageal cancer screening is a major milestone. We are very proud to be supporting Odin Vision as part of our Accelerator program aimed at speeding up the adoption of technology in NHS. Odin Vision's work to-date in utilizing cutting-edge AI technology to support early detection of colorectal cancer has been remarkable, so I'm looking forward to seeing the impact of this new AI system on oesophageal cancer."

Provided by University College London

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