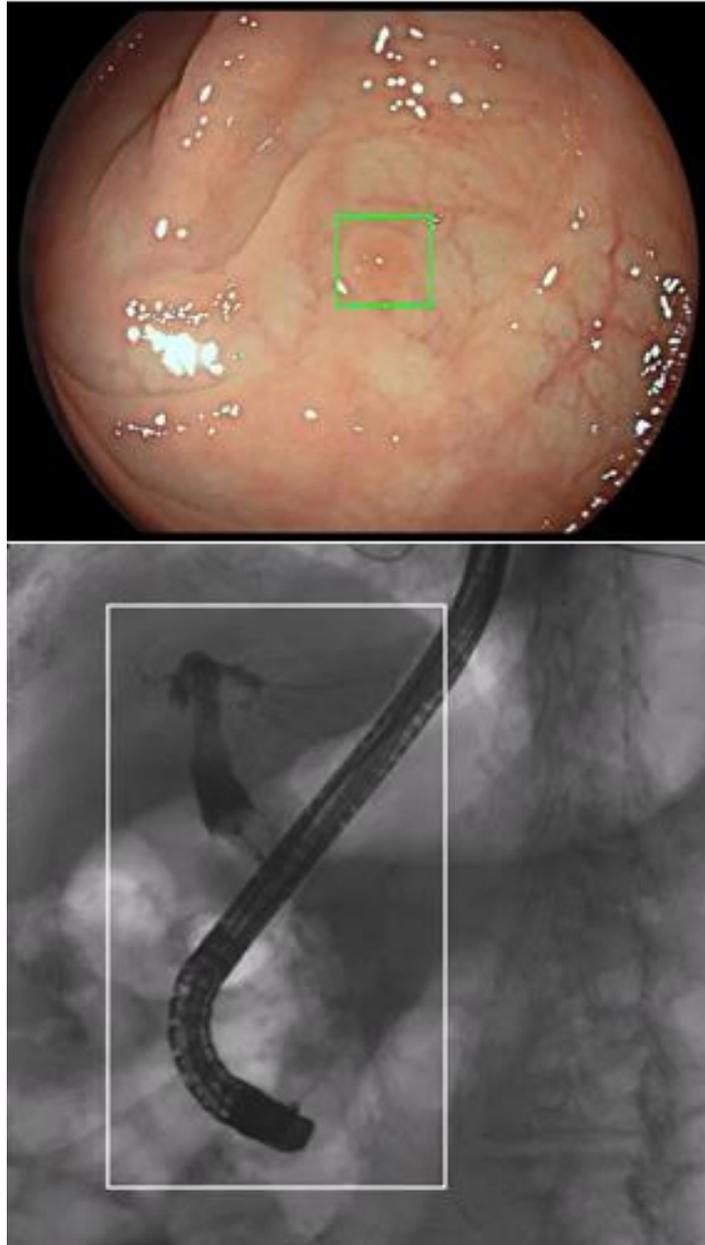


Artificial Intelligence in Gastrointestinal Endoscopy

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Artificial intelligence, or AI, has transformed several industries and is now commonly used in many products and services. In medical applications, AI is most frequently associated with image analysis and classification. In fact, AI shows great promise in endoscopic image analysis. But is there more AI can do? How else can AI improve gastrointestinal endoscopy?

The potential of AI has shown itself most prominently in computer-aided diagnosis of colorectal polyps. AI has demonstrated high sensitivity and accuracy in this task, even when compared to human endoscopists. During a colonoscopy screening, for example, AI can alert an endoscopist to the presence of a polyp – most typically highlighted onscreen with a small box outline. These identifications aren't meant as a replacement to the skill of the endoscopist, but as an aid in their examination.

A paper published to [NCBI](#) titled “Artificial Intelligence in gastrointestinal endoscopy” (Rahul Pannala, MD, MPH, FASGE, Kumar Krishnan, MD, et al., 2020) detailed the concepts of artificial intelligence as well as applications in endoscopy. First among these listed is the detection, classification, and cancer prediction of colorectal polyps. Their work provides a thorough review of studies on the applications of AI in gastrointestinal endoscopy.

In an earlier [article](#) by Jennifer Bresnick (2018) discussing the top 12 ways AI will impact healthcare, Jeffrey Golden, MD stated that artificial intelligence can improve productivity by identifying features of interest in images before a human clinician reviews the data. Dr. Bresnick concluded that inserting intelligent algorithms into (medical) devices can reduce cognitive burdens on physicians and help patients receive better healthcare.

This returns us to the question – How else can AI improve gastrointestinal endoscopy?

Artificial intelligence promises much in healthcare innovation. AI can, for instance, determine and control certain aspects of medical procedures. AI then, can free the physician to focus on what's most important – their patient and the procedure outcome. AI can keep a physician's workflow uninterrupted with processes that can be effectively managed with remarkable results.

A perfect example of such a process is the establishment and control of the region of interest (ROI) during an interventional endoscopy procedure. Features of interest in images can be learned and controlled by AI to establish an ROI – represented onscreen as a live box outline.

Without AI, interventional endoscopy cases are often done using a full field of view (FOV), disregarding the physician's actual ROI. This exposes the patient to more radiation and staff to additional scatter radiation. [AI-enabled technology](#) can detect where in the anatomy an endoscopist is focused and automatically collimate to that ROI. The area outside of the ROI, the FOV, is then refreshed every set number of frames – saving radiation exposure to the patient and everyone in the room. Advanced image processing simultaneously and seamlessly integrates the ROI and FOV images into one continuous image.

AI provides an automatic, hands-free solution to radiation reduction – delivering the benefit of consistent and repeatable radiation reduction beyond what conventional, non-AI systems can provide while providing superior image quality with no change in existing workflow.

AI image-guided ROI systems are [proven to be safer](#) than non-AI systems and have become the new standard of care for interventional endoscopy imaging. AI technology creates a new modality in medical imaging.

The fluoroscopy systems designed and built by Omega use AI to deliver consistent and repeatable radiation reduction to patients and staff beyond anything else in use today – far exceeding ALARA goals. [Omega systems](#) are also specifically designed with features exclusively developed for ERCP and image-guided endoscopic GI procedures.

In 2020, Ohad Oren, MD et al wrote in [The Lance](#) that artificial intelligence is a disruptive technology that has shown excellent accuracy, sensitivity, and specificity in the detection of small radiographic abnormalities – that AI has the potential to improve public health.

That potential is already being realized today – not only in image analysis but also in the automation of processes and in the dramatic reduction of radiation during gastrointestinal endoscopy cases.



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