

Deep learning model aids differentiation of colon cancer, acute diverticulitis

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A three-dimensional (3-D) convolutional neural network (CNN) can be

used as an artificial intelligence (AI) support system for differentiating colon carcinoma (CC) and acute diverticulitis (AD) on computed tomography (CT) images, according to a study published online Jan. 27 in *JAMA Network Open*.

Sebastian Ziegelmayer, M.D., from the Technical University of Munich in Germany, and colleagues developed and evaluated a [deep learning algorithm](#) able to differentiate CC and AD on CT images and assessed the impact of the AI support system. A total of 585 patients who underwent surgery for CC or AD (267 and 318, respectively) between July 1, 2015, and Oct. 1, 2020, were included. 3-D bounding boxes including the diseased bowel segment and surrounding mesentery were delineated and used to develop a 3-D CNN. A study was conducted with 10 readers, who were asked to classify the testing cohort without and then with AI support.

The researchers found that for the test set, the 3-D CNN reached a sensitivity and specificity of 83.3 and 86.6 percent, respectively, compared with the mean reader sensitivity and specificity of 77.6 and 81.6 percent, respectively. There was significant improvement for the combined group of readers with AI support, from a sensitivity of 77.6 to 85.6 percent and from a specificity of 81.6 to 91.3 percent. The number of false-negative and false-positive findings were also reduced with AI support.

"Artificial intelligence support led to a significant increase in diagnostic performance of board-certified radiologists and radiology residents," the authors write.

More information: [Abstract/Full Text](#)

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