

## **Introduction:**

The use of Artificial Intelligence (AI) in endoscopy is growing however Computer Aided Detection (CADe) for neoplasia in patients with Inflammatory Bowel Disease (IBD) remains an area of unmet need despite this being a high-risk population. The aim of our study was to prospectively evaluate the performance of a novel CADe-IBD algorithm for detection of neoplasia in IBD patients.

## **Methods:**

Patients with a diagnosis of IBD due to undergo a colonoscopy were recruited. Patients had standard care with the use of virtual chromoendoscopy and mapping biopsies with the addition of real-time use of CADe-IBD in High-Definition White Light (HDWL). Full withdrawal videos were recorded. The CADe-IBD videos were then externally reviewed by 2 expert endoscopists to establish ground truth along with histology. Suspected lesions were either removed or biopsied.

## **Results:**

106 patients were recruited of which 94 patients were included in the study analysis. 51% of patients were male. Median age was 58 (range 20-82). 76.3% of patients had ulcerative colitis. Mean time from diagnosis to procedure was 18 years (range 1-60).

259 polyps in total were identified during colonoscopy of which 87.6% (n=226) were non-polypoid morphology (Paris Classification IIa, IIb, IIc). 24.8% (n=64) were neoplastic (adenoma with low or high grade dysplasia, or adenocarcinoma) histology.

The overall sensitivity for lesion detection of the CADe algorithm was 92.6%. Sensitivity sub-analysis was performed based on neoplastic histology (95.4%), diminutive size (93.8%), non-polypoid morphology (91.6%) and background Mayo score of 0 (93.4%), 1 (92.9%) and 2/3 (88.8%).

A total of 1056 non-targeted biopsies were taken during the procedures of which only 1 showed low grade dysplasia. 7 of the 8 targeted biopsies which showed neoplasia were also detected by CADe-IBD. There was an average of 1.07 false positives per examination, typically due to inflammation or mucosal folds.

## **Conclusions:**

This is the first ever report of the efficacy of a dedicated CADe algorithm for IBD neoplasia detection during real-time endoscopy. Our data demonstrates that the algorithm is highly effective at detecting lesions in IBD patients, regardless of their morphology, size, histology, or background mucosal inflammation. The miss rate for true neoplasia is extremely low raising a real possibility of CADe-IBD and HDWL endoscopy replacing the current practice of chromoendoscopy based surveillance. This calls for a head-to-head comparison of these two techniques.