

i-scan, technology with proven results

	N	Major findings/conclusions
UGI: i-scan	Sehgal <i>et al</i> , 2014	A novel endoscopic classification system using i-scan improves dysplasia detection in Barrett's oesophagus
	Hoffman <i>et al</i> , 2014	i-scan or acetic acid-guided biopsies have a significant higher diagnostic yield for identifying SCE, with significantly fewer biopsies, as compared to a protocol of random biopsies. Acetic acid and i-scan showed comparable results diagnosing SCE in our study.
	Cammarota <i>et al</i> , 2013	Image-enhancing endoscopic technology allows a clear visualization of villous patterns in the duodenum. By switching from the standard to the i-scan view, it is possible to optimize the accuracy of endoscopy in recognizing villous alteration in subjects undergoing endoscopic evaluation.
	Kang <i>et al</i> , 2013	Compared to WL endoscopy, applying i-scan in daily practice can improve the diagnostic yield of reflux esophagitis by detecting more minimal changes in the squamo-columnar junction of the esophagus and can improve the interobserver agreement of the modified Los Angeles classification.
	Kim <i>et al</i> , 2011	The use of i-scan endoscopy significantly improves the identification of minimal change in the Gastroesophageal Reflux Disease and helps to identify more precisely the type of minimal change
	Hoffman <i>et al</i> , 2009	Lugol's solution in conjunction with HD+ endoscopy significantly improves the identification of patients with esophagitis and reduces misclassification. The i-scan filter and chromoendoscopy help to identify reflux-associated lesions
IBD: i-scan	Iaccucci <i>et al</i> , 2015	The subtle histological abnormalities underlying the apparently healed mucosa in ulcerative colitis could be detected using high definition colonoscopy and the refined ECAP histology scoring system. These techniques detect residual abnormalities in the majority of patients with seemingly complete mucosal healing by conventional Mayo criteria
	Iaccucci <i>et al</i> , 2013	High definition i-scan offers the potential to better characterize the mucosa in patients with UC and may provide information about both inflammation and mucosal healing.
	Neumann <i>et al</i> , 2010	i-scan colonoscopy significantly improves the diagnosis of severity and extent of mucosal inflammation in patients with IBD. Therefore, i-scan may be of additional value for determining the grade of inflammation in patients with quiescent IBD.
LGI: i-scan in detection	Bisschops <i>et al</i> , 2016	i-scan Detects More Polyps in Lynch Syndrome (HNPCC) Patients
	Kim <i>et al</i> , 2016	Colonoscopy using HD i-scan had a significantly higher detection rate of colorectal polyps, including neoplastic polyps, because of improved sensitivity for detecting non-protruding lesions.
	Bowman <i>et al</i> , 2015	i-scan detects more adenomas and advanced polyps compared to high definition white light endoscopy
	Neurath <i>et al</i> , 2013	i-scan improves the detection of right sided colon adenomas in comparison to high-definition white light endoscopy
	Testoni <i>et al</i> , 2013	Nonexpert endoscopists had a similar detection rate of mucosal lesions compared to expert endoscopists when using i-scan; when using standard WLE experts detected more lesions than nonexperts
	Testoni <i>et al</i> , 2012	Compared to standard white light colonoscopy, i-scan detects more polyps, specifically flat and small polyps (<10 mm)
	Hoffman <i>et al</i> , 2010	i-scan can detect and identify small adenomatous polyps as well as standard chromoendoscopy in the distal 30 cm of the colon
LGI: i-scan in vivo characterization	Hoffman <i>et al</i> , 2010	i-scan detects more colorectal neoplasia compared to standard video endoscopy; i-scan can accurately predict polyp histology
	Rath <i>et al</i> , 2015	High-definition endoscopy in combination with digital chromoendoscopy allowed real-time in vivo prediction of distal colorectal polyp histology and is accurate enough to leave distal colorectal polyps in place without resection or to resect and discard them without pathologic assessment. This approach has the potential to reduce costs and risks associated with the redundant removal of diminutive colorectal polyps.
	Guo <i>et al</i> , 2015	Meta-analysis Endoscopic diagnosis with i-scan has accurate optical diagnostic performance to differentiate neoplastic from non-neoplastic polyps with an area under the HSROC curve exceeding 0.90. Both the sensitivity and specificity for diagnosing colonic polyps are over 90%.
	Basford <i>et al</i> , 2014	84 A single endoscopist was able to predict histology of small polyps (<10 mm) with high accuracy using both HDWLE and i-scan; there was no difference in prediction between i-scan and HDWLE (both met ASGE performance thresholds)
	Basford <i>et al</i> , 2013	145 1) Even in expert hands there is a significant learning curve when using a new technology for the in-vivo characterization of small colonic polyps. 2) The PIVI threshold for a 'resect and discard' policy may require a longer training period than for a 'do not resect' policy 3) These results should help define standards of training in clinical practice for in-vivo characterization of small colonic polyps.
	Pigo <i>et al</i> , 2013	78 HDWL i-scan technology helps for characterization of polyps of the colon with good accuracy even if it cannot replace, at the moment, the histopathological examination. Reproducibility among operators is supported by a moderate substantial interobserver and intraobserver agreement.
	Hong <i>et al</i> , 2012	389 i-scan did not detect more polyps or adenomas compared to HDWLE; i-scan in mode 2 better predicted polyp histology than HDWLE
Lee <i>et al</i> , 2011	142 i-scan and narrow band imaging (NBI) have similar efficacy in predicting histology of diminutive polyps compared to high definition white light colonoscopy (both superior to HDWLE)	
Hoffman <i>et al</i> , 2010	220 i-scan detects more colorectal neoplasia compared to standard video endoscopy; i-scan can accurately predict polyp histology	

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Neumann <i>et al</i> , 2016	298 images	Accurate interpretation of i-scan images for prediction of advanced colorectal neoplasia can successfully be performed even by nonexpert endoscopists with a high overall accuracy and excellent interobserver agreements
Masci <i>et al</i> , 2013	400 images	We observed good interobserver agreement in the evaluation of neoplastic and non-neoplastic lesions and poor agreement in the evaluation of pit-pattern and margins. Adequate training is required in order to interpret images acquired with the i-scan technique
Bowens <i>et al</i> , 2013	550 images	Eleven endoscopists without previous experience on optical diagnosis evaluated a total of 550 images (396 adenomatous, 154 non-adenomatous). After a single training session, endoscopists with varying levels of experience can already provide optical diagnosis with an accuracy of 84.0%.
Neumann <i>et al</i> , 2013	110 images	Accurate interpretation of CVC images for prediction of hyperplastic and adenomatous colorectal lesions follows a learning curve but can be learned rapidly.
Wang <i>et al</i> , 2012	45 images	Computer-generated enhancements are satisfactory in predicting the histology of small colon polyps without the need for magnification. This advantage is mostly related to the pit pattern enhancement

Studies on i-scan OE

Preliminary data on i-scan OE

	Published studies
Mönkemüller <i>et al</i> , 2013	Present and future perspectives of virtual chromoendoscopy with i-scan and optical enhancement technology. Digestive Endoscopy 2013; 26.
Koike <i>et al</i> , 2013	Evaluation of a new image-enhanced endoscopic technology using band-limited light for detection of esophageal squamous cell carcinoma. Digestive Endoscopy 2013

DDW (Digestive Disease Week) 2016 abstracts

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UGI	Robles-Medranda <i>et al</i>	57 patients	OE system™+Magniview™ scopes can detect minimal esophageal lesions (MEL) and predict gastroesophageal reflux disease (GERD) with a high sensitivity and accuracy. The presence of MEL has a high grade of correlation with histology inflammation
	Neumann <i>et al</i>	100 areas	The newly introduced OE technology significantly improves diagnosis of GERD compared to high-definition whitelight endoscopy. The results should now be confirmed in a multicenter trial.
IBD	laccuci <i>et al</i>	34 patients	The new OE-i-scan with magnification may accurately reflect histologic abnormalities demonstrated by ECAP histology score which incorporates the full spectrum of acute and chronic histologic abnormalities. This demonstrates that with advanced CE technology, endoscopic assessment of ulcerative colitis is starting to approximate histology.
	laccuci <i>et al</i>	57 patients	Use of i-scan OE to evaluate accuracy and inter-observer agreement in polyp characterization. Gastroenterologists and physicians without prior experience in novel i-scan OE magnification colonoscopy can achieve significant improvements in predicting polyp histology after a brief training session using videos. Both NICE and ICE polyp classification performed equivalently.
LGI	Neumann <i>et al</i>		Developed and validated for the first time a simple and effective classification system for differentiating hyperplastic and adenomatous colorectal lesions by using the newly introduced OE-technology during real-time colonoscopy. These findings need to be evaluated in future prospective, controlled, and blinded clinical trials.

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