SUPPLEMENTAL MATERIALS
Artificial intelligence-assisted colonoscopy in real-world clinical practice: A systematic review and meta-analysis

Mike Tzuhen Wei[1]*, Shmuel Fay[2]*, Diana Yung[3], Uri Ladabaum[1]**, Uri Kopylov[2]**

1-Division of Gastroenterology and Hepatology, Stanford University School of Medicine, Stanford, California
2- Department of Gastroenterology, Sheba Medical Center, Ramat Gan, Israel, and Tel Aviv University Medical School
3- Gold Coast Hospital and Health Service, Gold Coast, Australia
*-shared first authorship
**-shared last authorship

Supplementary Table 1: Search strategies used for the meta-analysis

Database	Search Strategy
Pubmed	("artificial intelligence"[All Fields] OR "computer-assisted"[All Fields] OR "computer-aided"[All Fields] OR "computer-assisted"[All Fields]) AND ("colonoscopy"[MeSH Terms] OR "colonoscopy"[All Fields] OR "colonoscopies"[All Fields]) AND ("polyps"[All Fields] OR "polypous"[All Fields] OR "polyps"[MeSH Terms] OR "polyp"[All Fields] OR ("adenoma"[MeSH Terms] OR "adenoma"[All Fields] OR "adenomas"[All Fields]))
EMBASE	('artificial intelligence'/exp OR 'artificial intelligence' OR 'computer-assisted' OR 'computer-aided') AND ('colonoscopy'/exp OR 'colonoscopy' OR 'colonoscopies') AND ('polypous' OR 'polyps'/exp OR 'polyps' OR 'polyp'/exp OR 'polyp' OR 'adenoma'/exp OR 'adenoma' OR 'adenomas')

Supplemental Table 2: Newcastle–Ottawa scale for assessing the quality of non-randomized studies

Study	Selection	Compatibility	Outcomes	Total Stars*
Quan[6]	4	2	3	9
Koh [12]	4	1	3	8
Ishiyama[11]	4	1	3	8
Shaukat[16]	4	2	3	9
Richter[14]	4	1	3	8
Nehme[13]	4	2	3	9
Ahmad[18]	4	1	3	8
Agazzi[19]	4	1	3	8
Wong [17]	4	2	3	9
Schauer[15]	4	1	3	8
Levy[8]	4	1	3	8
Ladabaum[7]	4	2	3	9

*Maximum of 9

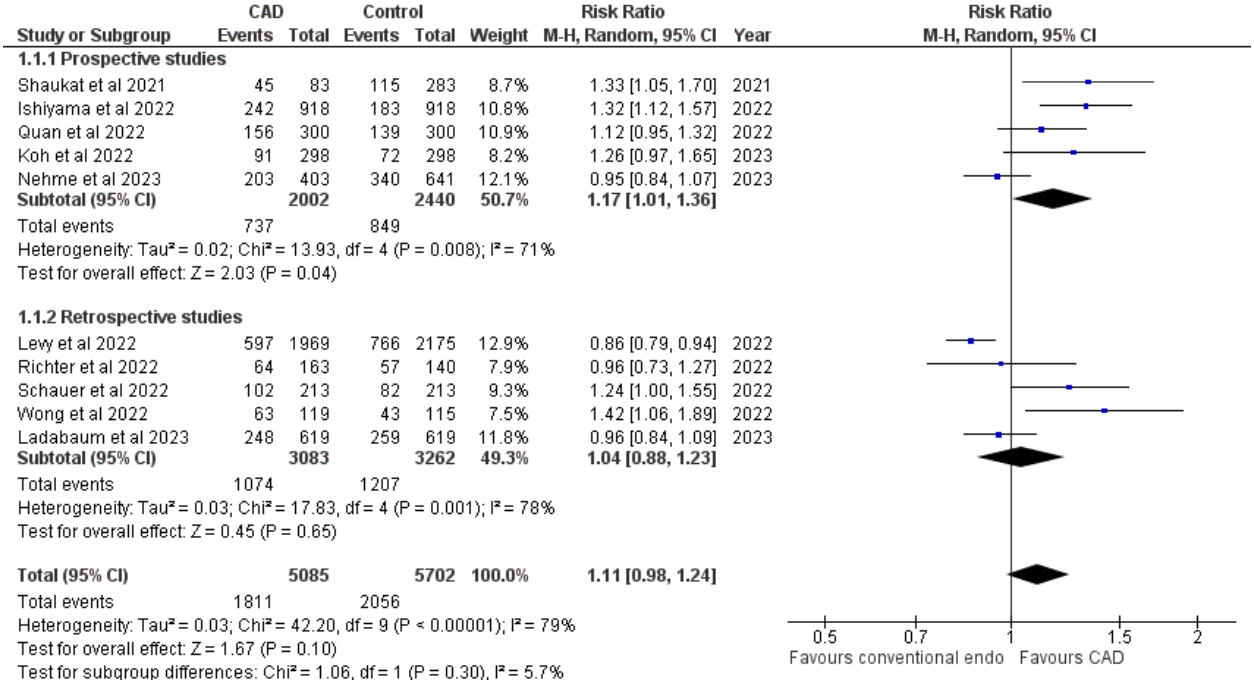
Supplemental Table 3: Studies implementation strategy details

Study	Year	Publication type	Location	Study Design	Implementation strategy	Control	CADe used (N)	Without CADe (N)	CAD vs without CADe APC (p-value)	CAD vs without CADe ADR (p-value)
Quan	2022	Published full paper	United States	Multicenter prospective	Prospective single-arm, open-label pilot study with a historical control group.	Historical	EndoVigilant (N=300)	300	1.35 vs 1.07 (0.099)	52 vs 46.3 (0.165)
Koh	2022	Published full paper	Singapore	Single center prospective	Investigator-initiated prospective cohort study in a referral center during the trial period of an AI-assisted colonoscopy device. Specialist-grade endoscopists performed colonoscopies.	Historical	GI Genius (N=298)			30.4 vs 24.3 (0.02)
Ishiyama	2021	Published full paper	Japan	Single center prospective	Propensity score-matched, prospective, non-blinded, registered as a clinical trial. CADe system implemented in 4 out of 8 colonoscopy rooms, allocation based on room availability. CADe system activated after cecal intubation in CADe group. Endoscopists performed withdrawal with or without CADe system based on group assignment.	Concurrent	EndoBRAINEYE (N=918)	918	0.42 vs 0.3, (0.003)	26.4 vs 19.9 (0.001)
Shaukat	2022	Published full paper	United States	Single center prospective	Prospective pilot study was conducted for 6 weeks by three experienced providers. Compared to historical cohort. This was the first clinical pilot of this CADe.	Historical	Skout (N=83)	283	1.46 vs 1.01 (0.104)	54.2 vs 40.6 (0.028)

Richter	2023	Published full paper	Germany	Single center retrospective	CAD group data collected forward from the time of AI system inauguration in routine practice. Compared to historical cohort.	Historical	CADEye (N=163)	140		39 vs 41 (>0.05)
Nehme	2021	Published full paper	United States	Single center prospective	Retrospective analysis of a prospectively maintained database of patients undergoing colonoscopy at a tertiary center, before and after a CADe system was made available. The decision to activate the CADe system was at the discretion of the endoscopist.	Historical	GI Genius (N=403)	641	1.27 vs 1.17, (0.45)	50.4 vs 53 (0.41)
Ahmad	2021	Abstract	England	Single center prospective	A prospective study, in one month period, all colonoscopies were performed with the addition of a CAD. Endoscopists completed an evaluation form after the procedure. Compared to the previous month's cohort.	Historical	GI Genius (N=82)	86		48.8 vs 46.5 (0.77)
Agazzi	2022	Abstract	Italy	Single center prospective	Retrospective, single-center cross-sectional study conducted in an open access high volume endoscopy unit.	Historical	CADEye (N=250)	450		46 vs 30.7 (<0.005)
Wong	2022	Abstract	Hong Kong	Single center retrospective	Retrospective study comparing outcomes before and after ENDO-AID implementation. Single experienced endoscopist. Minimalist deployment strategy.	Historical	ENDO-AID (N=119)	115		52.9 vs 37.4 (0.017)
Schauer	2021	Published full paper	New Zealand	Single center retrospective	A single-center retrospective, real-world setting, study. Endoscopists were able to toggle AI on-and-off at their discretion. The Endo-AID equipment from Olympus was loaned free of charge. There was no prior experience or training provided for the software.	Historical	ENDO-AID (N=213)	213		47.9 vs 38.5 (0.03)
Levy	2022	Published full paper	Israel	Single center retrospective	Retrospective observational study evaluating deployment of GI Genius at an academic tertiary medical center. Data collected for 6 months in 2021 with comparison to historical data for corresponding 6 months in 2020.	Historical	GI Genius (N=1,969)	2175	0.6 vs 0.68 (0.001)	30.3 vs 35.2 (0.001)
Ladabaum	2022	Published full letter	United States	Single center retrospective	Real-world setting, retrospective observational study in high-volume tertiary medical center. For 3 months, the CAD was switched on routinely at the start of every colonoscopy withdrawal. Historical and concurrent non-CADe controls. A representative mix of patients and physicians.	Historical and concurrent	GI Genius (N=619)	619	0.78 vs 0.89 (0.63)	40.1 vs 41.8 (0.41)

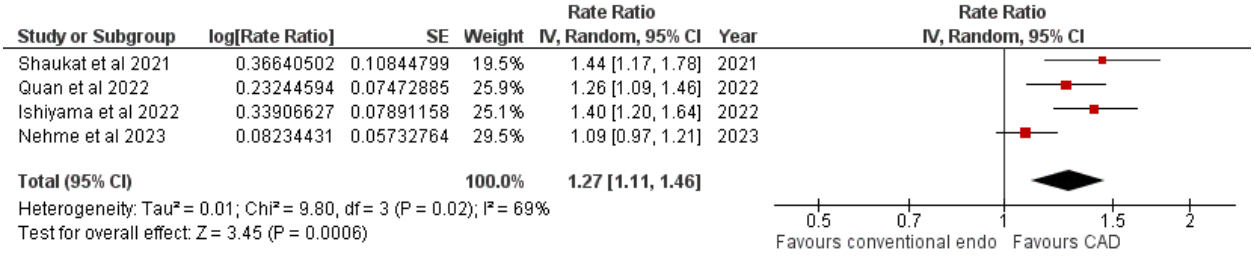
CADe: computer-assisted detection; ADR: Adenoma detection rate; APC: Adenoma per colonoscopy

Supplemental Figure 1: Pooled ADR risk ratio of only full studies



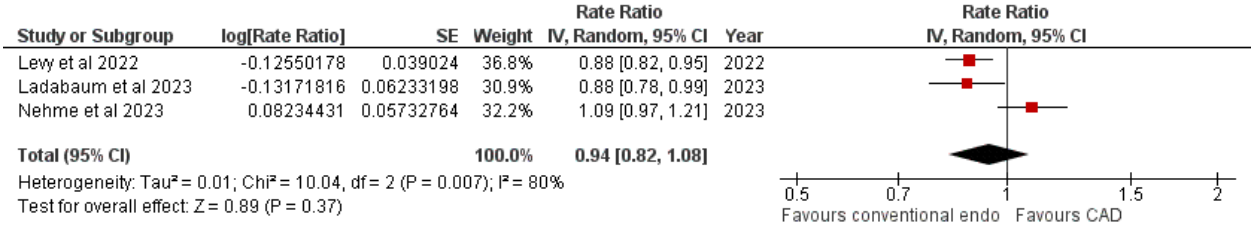
ADR: Adenoma detection rate; CADe: computer-assisted detection

Supplemental Figure 2: Pooled APC evaluating prospective studies only



APC: Adenoma per colonoscopy; CADe: computer-assisted detection

Supplemental Figure 3: Pooled APC risk ratio of full studies evaluating only GI Genius



APC: Adenoma per colonoscopy; CADe: computer-assisted detectio