

How to minimize missing polyps during colonoscopy?

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- Why is it essential to find colon polyps?
- Reasons to keep High ADR
- Endoscopist and technical factors for high ADR
- Equipment & Devices for High ADR
- Could artificial intelligence be of great help?
- Take Home Message



Colorectal cancer (CRC) is a commonly diagnosed malignancy worldwide.
: the 3rd in males & 2nd in females

World Health Organization 2014.

Journal of Environmental Science and Health Part C. 2006

CA: a cancer journal for clinicians. 2011

CRC in Eastern Asia and Eastern Europe: ↑ rapidly

Cancer Epidemiol Biomarkers Prev. 2009

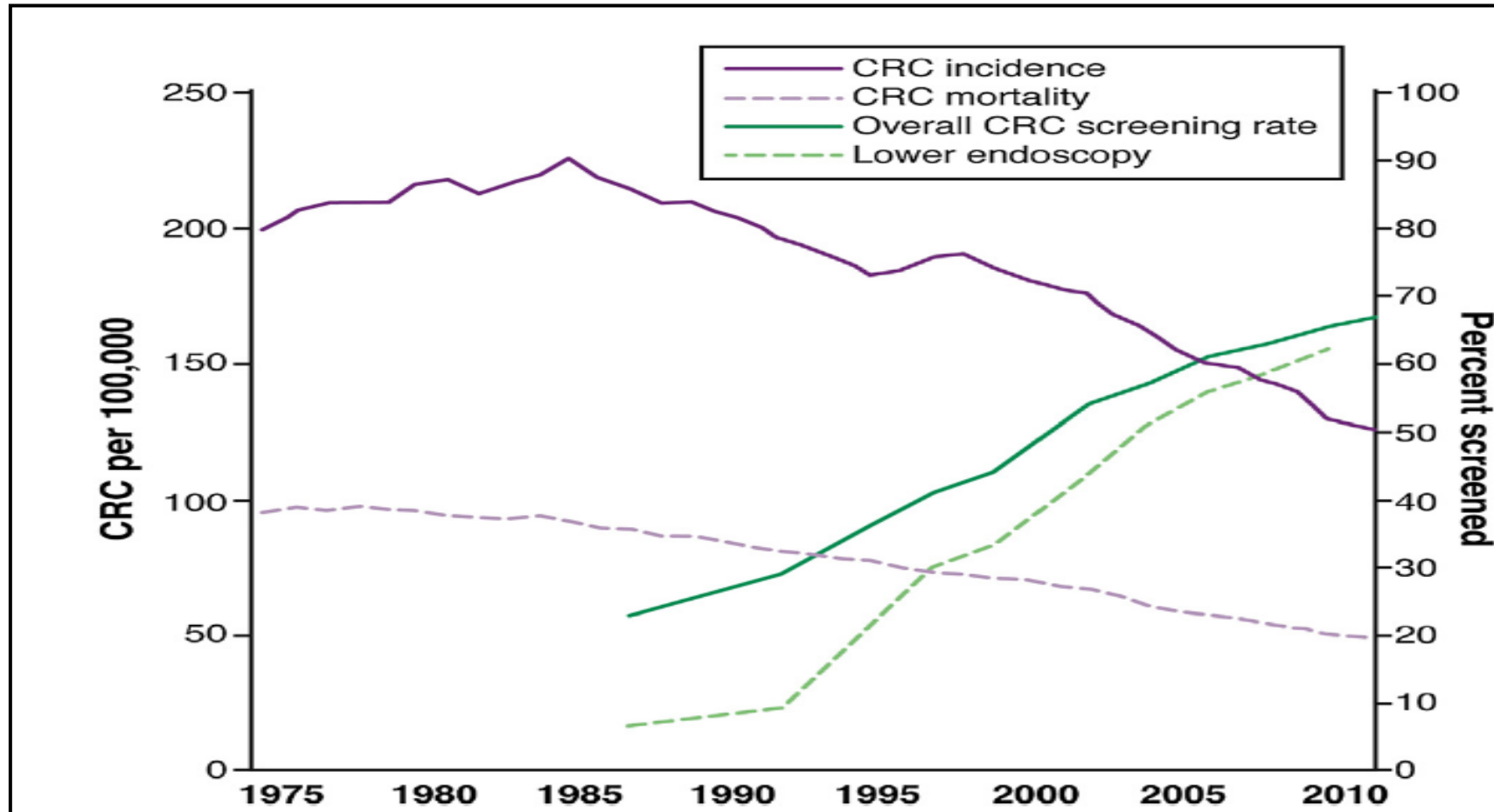
Fortunately, the mortality rates of CRC of some developed countries ↓ ↓
: early detection and treatment

CA: a cancer journal for clinicians. 2009



Introduction

CRC screening & Colonoscopy \uparrow \rightarrow **CRC incidence & mortality \downarrow**



Quality indicator	Grade of recommendation	Measure type	Performance target (%)
7. Frequency with which visualization of the cecum by notation of landmarks and photodocumentation of landmarks is documented in every procedure (priority indicator)	1C	Process	
Cecal intubation rate with photography (all examinations)			≥90
Cecal intubation rate with photography (screening)			≥95
8. Frequency with which adenomas are detected in asymptomatic average-risk individuals (screening) (priority indicator)	1C	Outcome	
Adenoma detection rate for male/female population			≥25
Adenoma detection rate for male patients			≥30
Adenoma detection rate for female patients			≥20
9a. Frequency with which withdrawal time is measured	2C	Process	>98
9b. Average withdrawal time in negative-result screening colonoscopies	2C	Process	≥6 min

Low ADR can be lead to interval colorectal cancer.

Table 3. Risk Factors for Interval Colorectal Cancer.

Variable	No. of Subjects	No. of Interval Cancers	P Value (Likelihood-Ratio Test)*	Hazard Ratio (95% CI)	P Value
Subjects					
Adenoma detection rate			0.008		
≥20.0%	9,255	1		1.00	
15.0–19.9%	6,607	7		10.94 (1.37–87.01)	0.02
11.0–14.9%	13,281	12		10.75 (1.36–85.06)	0.02
<11.0%	15,883	22		12.50 (1.51–103.43)	0.02

Low ADR of less than 20% increases the risk of INTERVAL COLORECTAL CANCER by more than 10 times.

Adenoma miss rate (AMR)

1 st Author	Year	Journal	Results	Study Design
Rex	1997	Gastroenterology	24% of adenomas missed 6% of large adenomas missed	183 patients
van Rijn	2006	Am Journal of Gastroenterology	22% of adenomas missed 2.1% of large adenomas missed	465 patients Meta analysis
Heresbach	2008	Endoscopy	21% of adenomas missed 11% of advanced adenomas missed	286 patients
Rex	2011	Gastrointestinal Endoscopy	12% of large adenomas in AC missed	1000 patients (Retroflexion)
Siersema	2012	World Journal of Gastroenterology	11.8% of large adenomas missed	395 patients (Third eye)

AMR: 21-24%(≥ 20%) Large AMR: 2.1-12%



Why do we miss the polyps?

- Inadequate bowel preparation
- Suboptimal technique and hasty withdrawal
- Flat, depressed or subtle lesions
- Inability to see proximal sides of haustral folds
- IC valve and flexures

Gastroenterology 1997;112:24-28

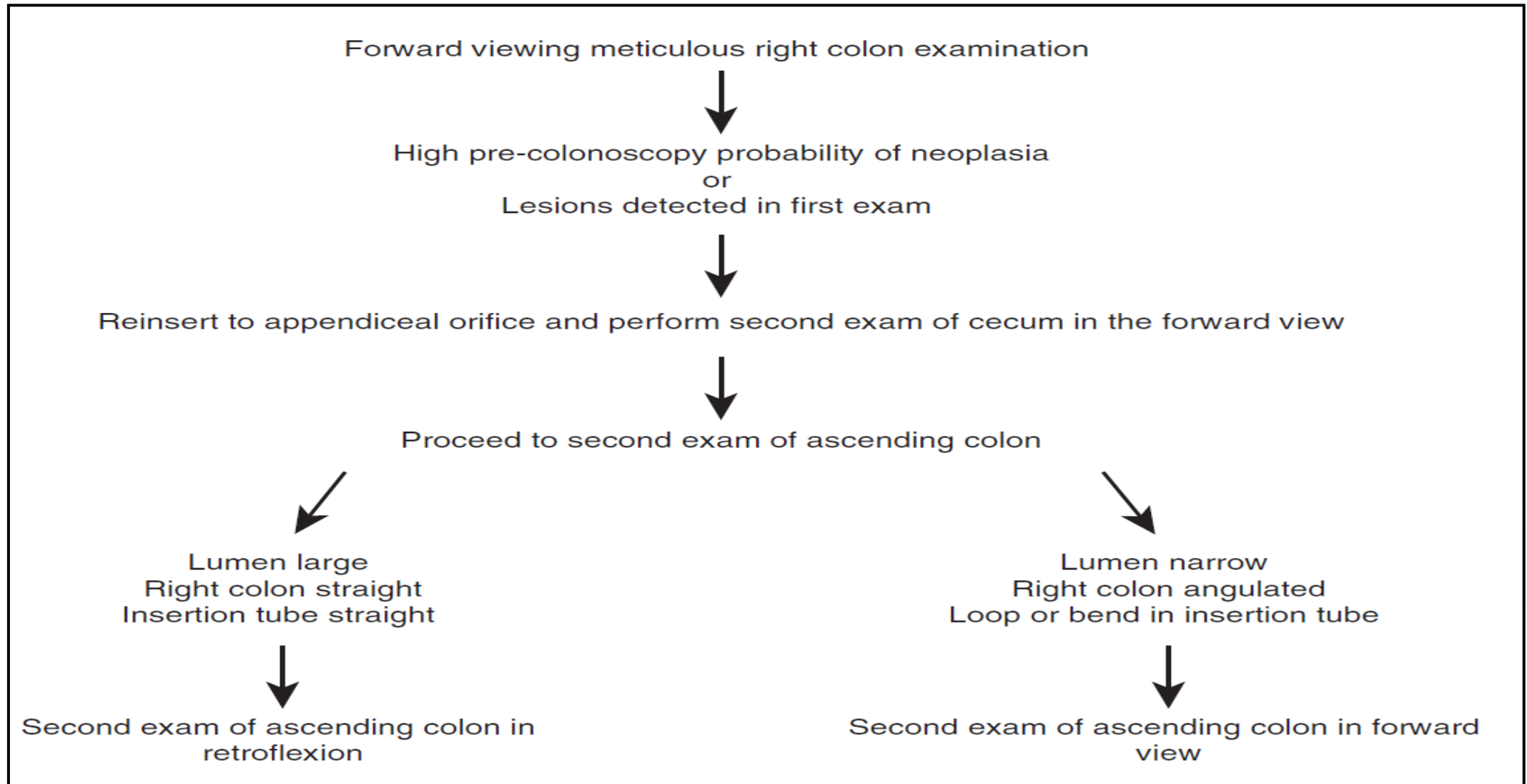
Kaminski et al. NEJM 2010;362:1795-1803

Corley D et al. NEJM 2014;370:1298-1306



- Quality improvement should be **focused on** lesion recognition and **effective mucosal exposure technique**.
- Average withdrawal times in normal colons of **8-10min** rather than 6 min.
- In an individual with low ADR, short mean withdrawal times **indicate probable ineffective technique**.





High-definition & Image-enhanced endoscopy

Standard Definition	High Definition
640 x 480 pixels	> 1 million pixels
480 effective scan lines	1080 effective scan lines
	HD monitor & image with Charged couple device (CCD)

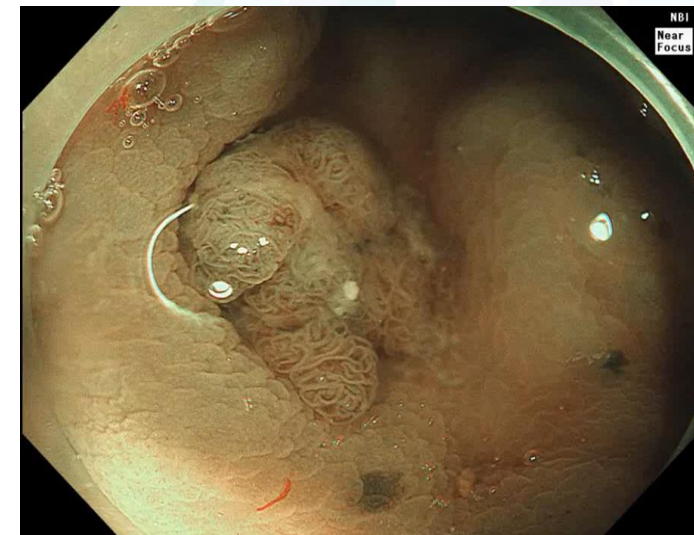
HD colonoscopy

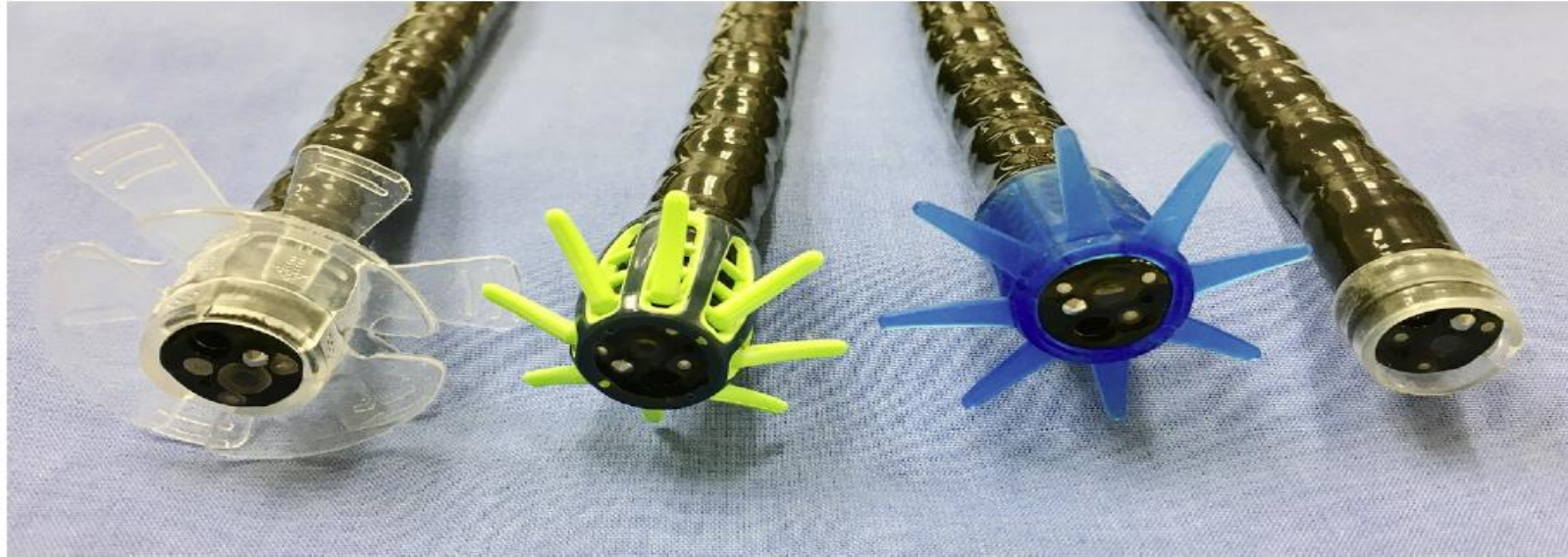


NBI



Near Focus

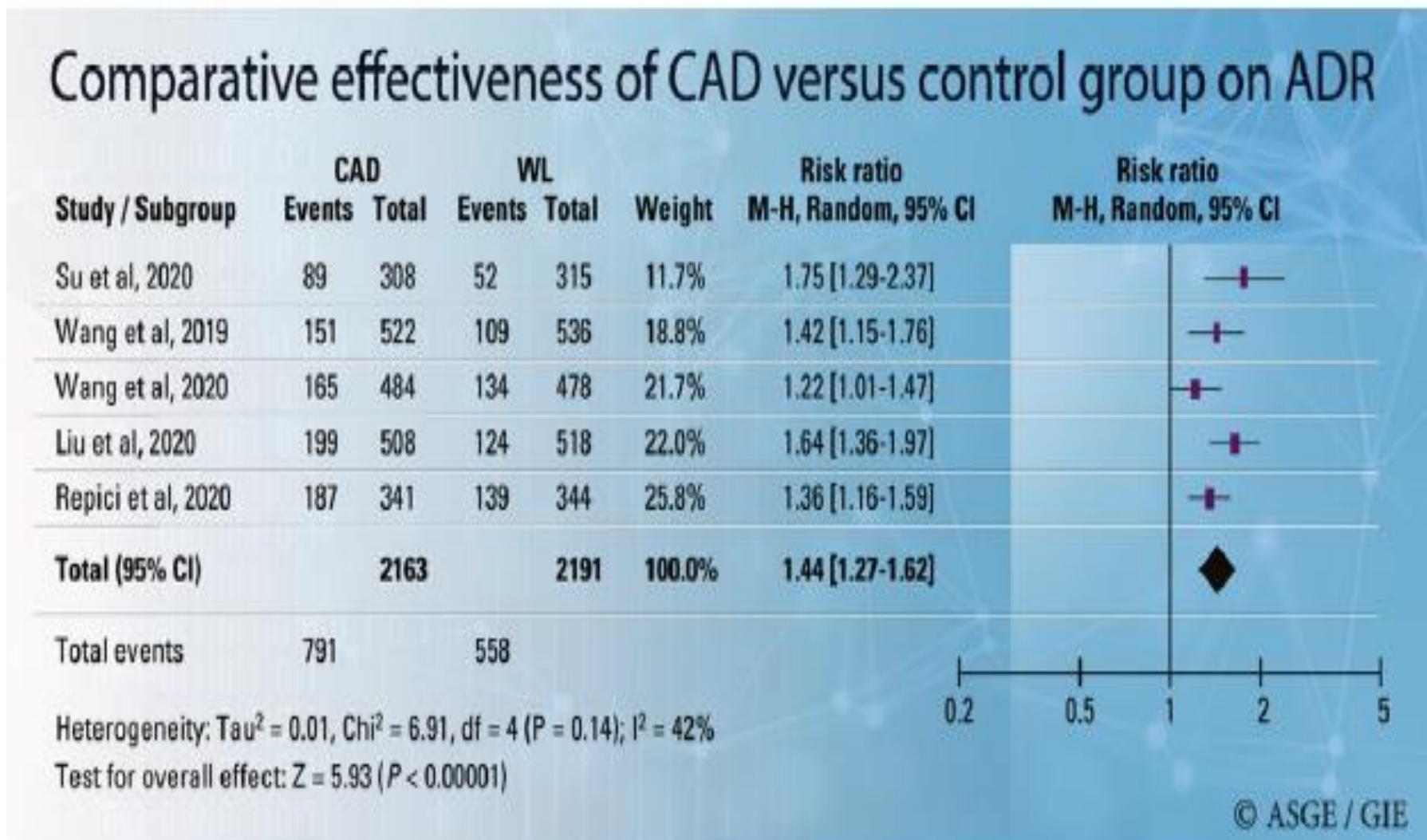




Devices that are fixed to the colonoscope tip for the purpose of flattening folds, including a **short cap or hood, Endocuff, Endocuff Vision, Endorings, and balloon colonoscopy**, are all effective in **increasing ADR**.



CADe (Computer-aided polyp detection)



Take-home message; There is no easy way!

- The most important thing is to observe while exposing more of the colonic mucosa during sufficient withdrawal time.
- You can't see the thief behind the wall.
- It may not be easy in real situation for a number of reasons, but you should try to do a colonoscopy **as you know and learn.**

