



# 9<sup>TH</sup> ANNUAL ***DIGESTIVE DISEASES: NEW ADVANCES***

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# How to Increase the Adenoma Detection Rate

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The background of the slide features a horizontal band with various medical and scientific icons. These include a heart with a cross, a microscope, a pill, a first aid kit, a stethoscope, a virus particle, and a bar chart. The icons are rendered in a light, semi-transparent style against a darker background.

# Disclosure

## **Sushil Ahlawat, MD, FACP, FASGE, AGAF**

- No relevant financial relationships to disclose.

# Learning Objective

- What is adenoma detection rate (ADR) for colonoscopy
- Why ADR is important
- Interventions to improve ADR

# Colorectal Cancer (CRC)

- Life time incidence 5%
- Majority of cases occur after age 50
- One-third of patients with CRC die from the disease
- CRC is preventable disease
- CRC screening is cost-effective

# USPSTF Recommended CRC Screening Modalities in 2021

- High-sensitivity gFOBT every year
- FIT every year
- sDNA-FIT every 1 to 3 years
- CT colonography every 5 years
- Flexible sigmoidoscopy every 5 years
- Colonoscopy every 10 years

# Colonoscopy

- Considered the screening test of choice
  - Detects CRC
  - Prevents CRC by detection and removal of adenomas
- Most CRC screening in US is done with colonoscopy
- One of the most common medical procedures performed in the US (19 million annually)

# Problem With Colonoscopy

- Polyps are missed (adenoma miss rate, 9-26 percent in tandem colonoscopy studies)
- 2.1 to 7.7% of CRCs diagnosed are *interval cancer* that develop after screening colonoscopy but before subsequent surveillance is indicated, *Post colonoscopy CRC (PCCRC)*
  - *75% of PCCRC is missed or preventable*
- Endoscopists do not monitor their performance, so they are not aware when they are not meeting quality standard
- *High-quality colonoscopy*



# High Quality Colonoscopy

- Adenoma detection rate (ADR)
- Cecal intubation rate
- Screening and surveillance intervals
- Rates of adequate bowel preparation

# Adenoma Detection Rate

- ADR is defined as the proportion of average risk patients (age  $\geq 50$ ) undergoing 1<sup>st</sup> time screening colonoscopy in whom an adenoma is found
- ADR is a validated predictor of CRC prevention
  - Kaminski et al. *NEJM*. 2010;362:1795.
  - Corley et al. *NEJM*. 2014;370:1298.

# ADR and Interval CRC

- Kaiser Permanente Northern California health plan members
- COL for any indication 1998-2010
- FI: 10 years, another COL, CRC dx, Jan 2011, termination of membership
- 139 GIs (min >300 COL, >75 screening COL)

# Adenoma Detection Rate and Risk of an Interval Colorectal Cancer Among All Patients

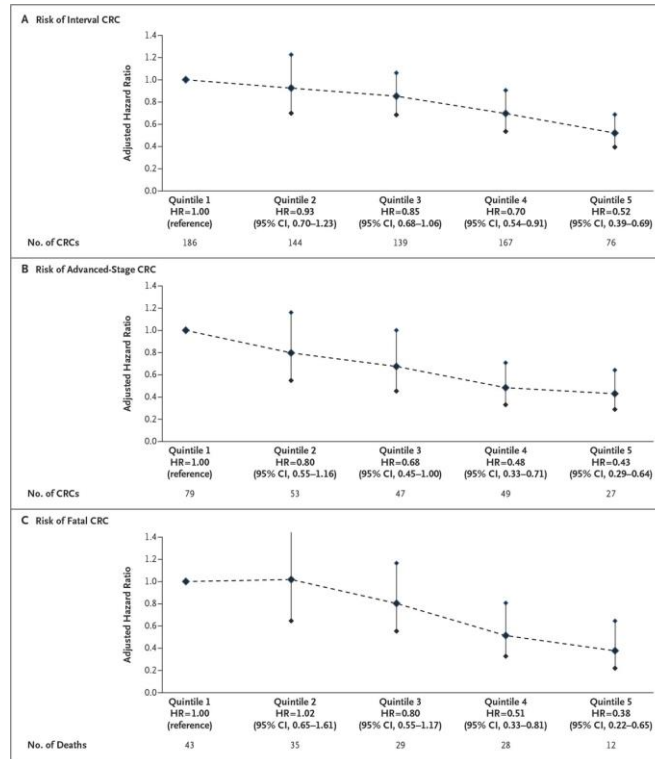
**Table 2. Adenoma Detection Rate and Risk of an Interval Colorectal Cancer among All Patients**

<b>Adenoma Detection Rate</b>	<b>Interval Cancer</b> <i>no. of cases</i>	<b>Hazard Ratio (95% CI)*</b>	<b>Unadjusted Risk</b> <i>no. of cases / 10,000 person-yr</i>
Continuous rate	712	0.97 (0.96-0.98)	7.7
Rate Quintile			
Quintile 1: 7.35-19.05%	186	1.00 (reference)	9.8
Quintile 2: 19.06-23.85%	144	0.93 (0.70-1.23)	8.6
Quintile 3: 23.86-28.40%	139	0.85 (0.68-1.06)	8.0
Quintile 4: 28.41-33.50%	167	0.70 (0.54-0.91)	7.0
Quintile 5: 33.51-52.51%	76	0.52 (0.39-0.69)	4.8

\* Hazard ratios were adjusted for age, Charlson comorbidity score, sex (in the model including both men and women), and indication for colonoscopy, with clustering according to physician.

Corley DA et al. *N Engl J Med.* 2014;370:1298-1306.

# Hazard Ratios for Colorectal Cancer, According to Quintile of Adenoma Detection Rates



# Quality Indicator of Colonoscopy

- 2015, ASGE and ACG published quality indicators for colonoscopy
- Current benchmark are ADR of 30% or > for men and 20% or > for women 50 years of age and older, for a blended rate of 25%
- Aspirational ADR 45-50%

# ADR: Weaknesses

- ADR can be gamed
  - “One and done” (corrected by “APC”)
  - Indication gaming
- ADR and serrated lesions
  - SSA/P not part of ADR measurement
  - Mixed data on correlation of ADR and serrated detection

# What Is High Level ADR Detection?

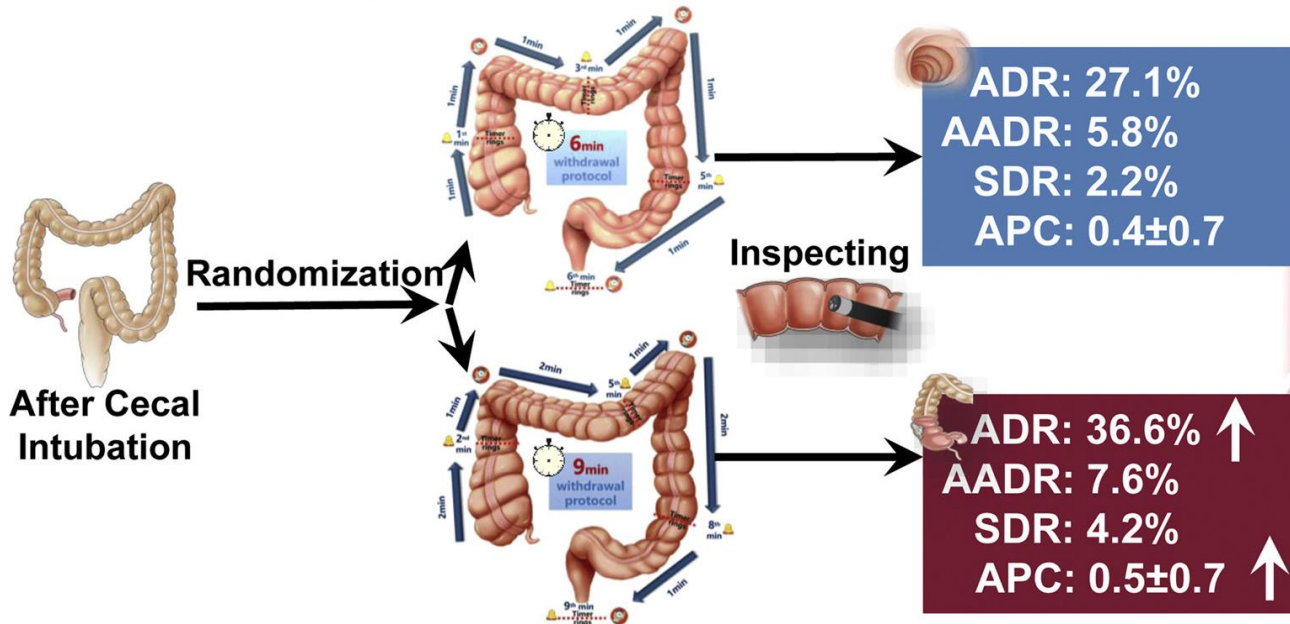
- High level ADR is 47-48% plus
- Proven gains in cancer protection up to about 35%
- Minimum threshold is 25% in mixed gender population
- ADR below 35% should be improved
- No need to adjust for population factor



# ADR and Withdrawal Time

- ADR and WT both predict CRC protection in retrospective studies
- WT does not work consistently in prospective studies
- Adequate WT follows adequate technique
- WT and ADR are medical-legal “issues”

# Impact of Withdrawal Time on ADR: 9 Min vs. 6 Min

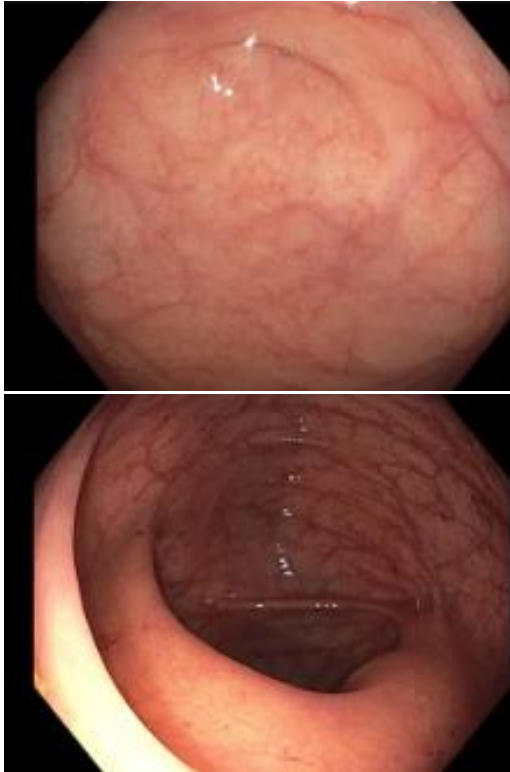


	6minutes (n=513)	9minutes (n=514)	Relative risk (RR, 95%CI)	P value
<b>ADR, n (%)</b>	<b>139(27.1)</b>	<b>188(36.6)</b>	<b>1.35(1.13, 1.62)</b>	<b>0.001</b>
<b>Location, n (%)</b>				
Right colon	39(7.6)	70(13.6)	1.79(1.24, 2.60)	0.002
Transverse colon	27(5.3)	52(10.1)	1.92(1.23, 3.01)	0.004
Proximal colon	61(11.9)	110(21.4)	1.80(1.35, 2.40)	<0.001
Left colon	97(18.9)	101(19.6)	1.05(0.82, 1.35)	0.76
<b>Size, n (%)</b>				
Diminutive (≤5 mm)	71(13.8)	96(18.7)	1.35(1.02, 1.79)	0.04
Small (6-9 mm)	59(11.5)	89(17.3)	1.51(1.11, 2.04)	0.008
Large (>10 mm)	27(5.3)	34(6.6)	1.26(0.77, 2.05)	0.36
<b>Morphology, n (%)</b>				
Flat or sessile	99(19.3)	141(27.4)	1.41(1.12, 1.76)	0.002
Semi-pedunculated	41(8.0)	52(10.1)	1.27(0.86, 1.87)	0.24
Pedunculated	10(1.9)	14(2.7)	1.40(0.63, 3.12)	0.41
<b>Pathology, n (%)</b>				
Tubular	122(23.8)	171(33.3)	1.40(1.15, 1.70)	0.001
(Tubulo)villous	15(2.9)	14(2.7)	0.93(0.45, 1.91)	0.85
HGIN	7(1.4)	11(2.1)	1.57(0.61, 4.01)	0.34

Clinical Gastroenterology  
and Hepatology

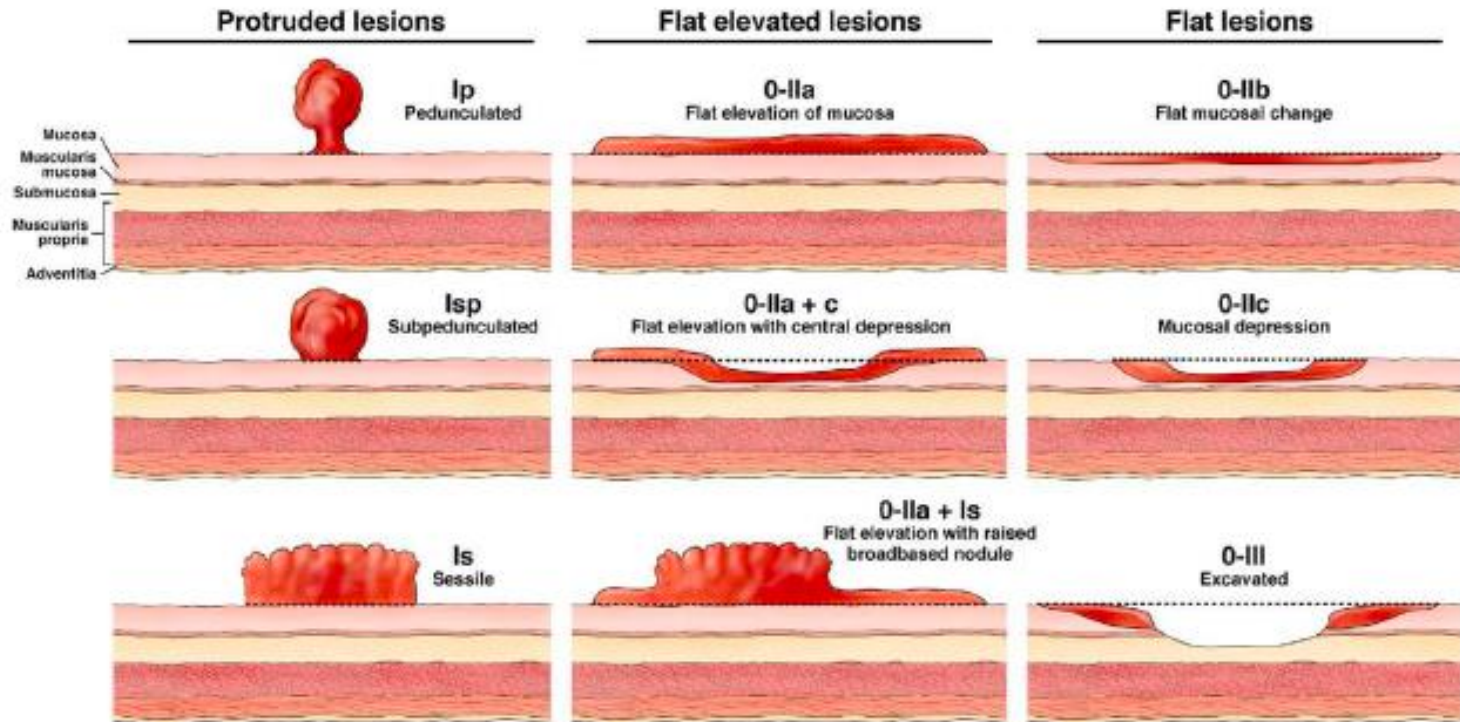
ADR, adenoma detection rate; AADR, advanced adenoma detection rate; SDR, sessile serrated lesion detection rate; APC, adenomas per colonoscopy; HGIN, High-grade intraepithelial neoplasia.

# Basics of High Level Adenoma Detection

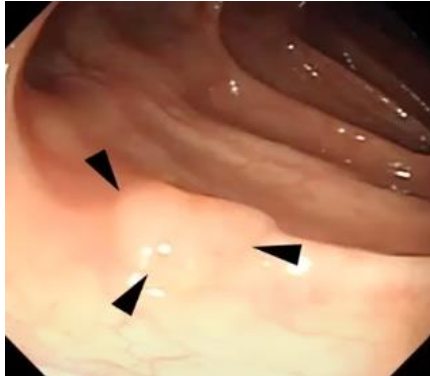
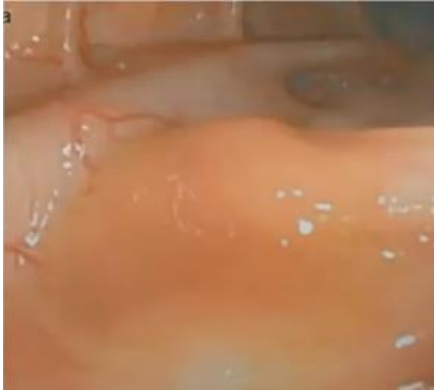


- Pre-procedure steps
  - Know disease spectrum
  - Split dose bowel prep
  - HD instruments
  - Measurement & reporting

# Paris Classification

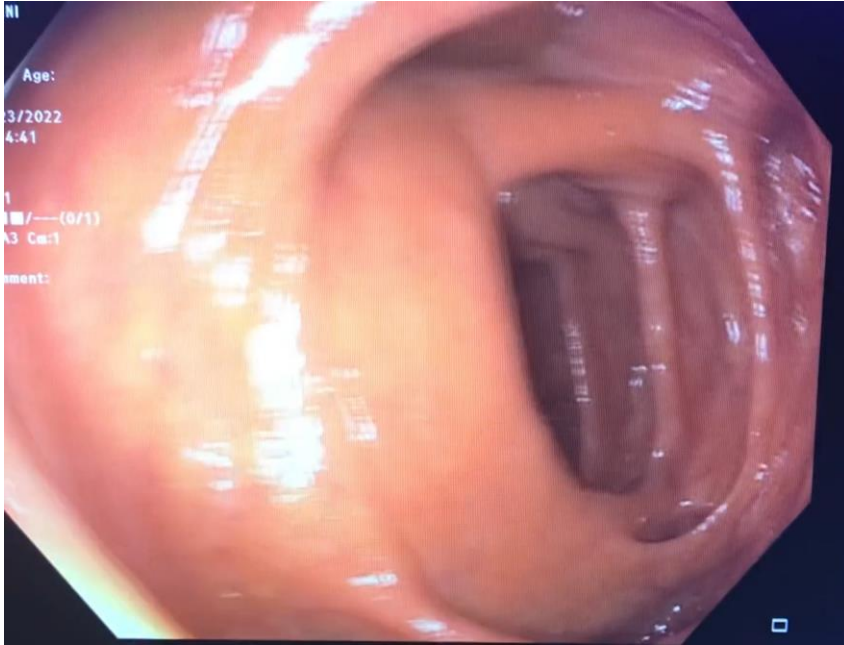


# Basics of High Level Adenoma Detection



- Missed polyps
  - Right sided
  - Flat/sessile
  - Irregular borders
  - Covered with mucus

# Basics of High Level Adenoma Detection

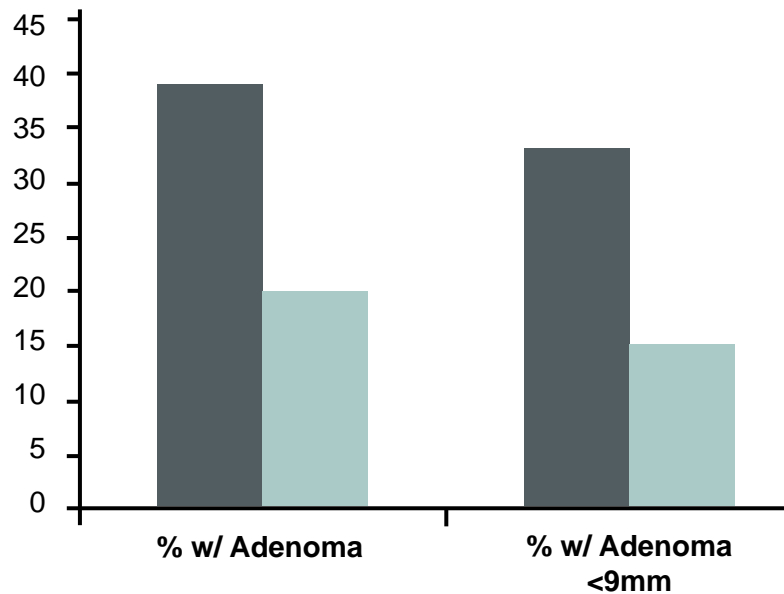


- Know disease spectrum
- Look behind fold
- Clean up debris
- Distend the colon

# ADR: Improve Bowel Prep

- Use split dose or same day prep
- Begin 2<sup>nd</sup> dose 4-6 hours prior to COL
- Judge prep after all washing has been done
- Adequate prep should be achieved in at least 85% of cases
- If inadequate prep, repeat within 1 year

- Split prep = Higher ADR





# ADR: Intra-Procedural Interventions

- Non-device techniques
  - Right colon RF (double exam)
  - Patient position
- Scope based techniques
  - FUSE, G-eye, Third eye panoramic, electronic chromo
- Add-on devices and technology
  - Endocuff, endoring, chromo, enhanced imaging technology

# ADR: Intra-Procedural Interventions

- Second look in the right-sided colon and cecum
  - 2<sup>nd</sup> forward-view look increases ADR by 10% for all adenomas, 5% for right sided adenomas
  - RF in the cecum increase ADR 17% for right-sided adenomas
    - Overall success rate 91%, adverse events .03%
  - No difference between 2<sup>nd</sup> forward-view Vs RF in cecum
  - 2<sup>nd</sup> look increase withdrawal time 1.5 to 1.6 minutes

# ADR: Intra-Procedural Interventions

- Patient position during withdrawal
  - Dynamic changes in patient position increases ADR 7% points
  - Mechanism is via adequate distension
  - No change in withdrawal times
  - Not feasible with MAC or morbidly obese patients
    - Use CO<sub>2</sub>, water

# ADR: Intra-Procedural Interventions



	Air	WI	WE	
N	217	217	217	
Overall ADR (%)	37.8	40.6	49.8	WE vs. AI, p=0.016; WE vs. WI, p=NS

Pt age, WE, indication, WT>8 min were significant predictors of ADR.  
*GIE*. 2017;86:192.

# ADR: Intra-Procedural Interventions

- Distal attachment devices designed to improve mucosal visualization
  - Increases ADR by 5 to 11% points
  - Additional cost
  - May reduce procedure time

# ADR: Intra-Procedural Interventions

- Image-enhanced endoscopy
  - Narrow band imaging (NBI)
  - Chromoendoscopy (methylene blue or indigo carmine)
  - pH- and time-dependent methylene blue formulation (MB-MMX)
    - ADR increased by 8%

# ADR: Intra-Procedural Interventions

- Computer aided detection (CADe) and Artificial intelligence (AI)
  - Polyp detection
  - Histology prediction
  - Prep quality
  - Mucosa exposed/seen
  - Adequate retroflexion
  - Increase ADR by 10% points

# Improvement in Adenomas per Colonoscopy Using a Computer-Aided Detection Device



Randomized trial, standard vs. CAde colonoscopy



1359 screening and surveillance participants



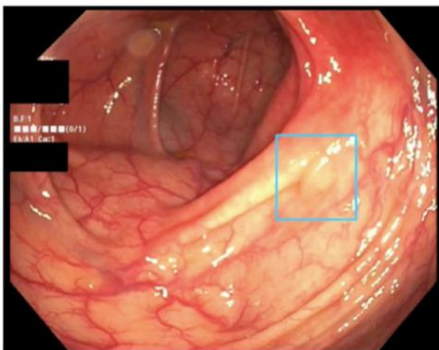
5 U.S.-based academic and community centers



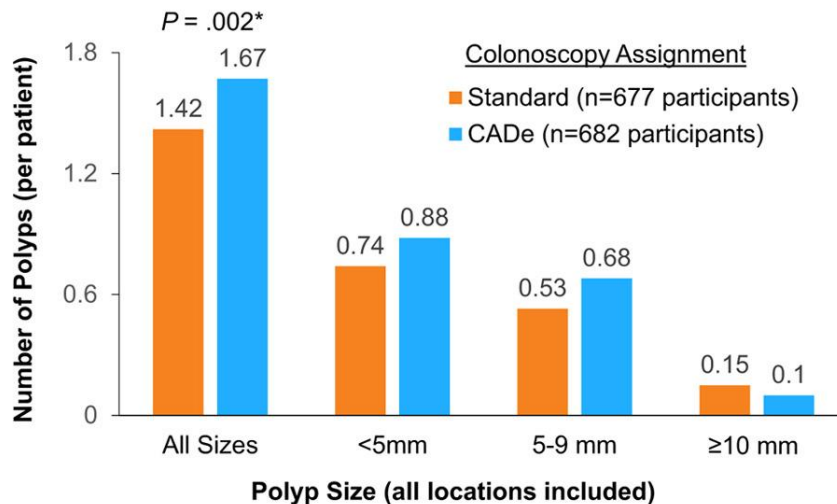
22 experienced endoscopists

↑ 27%

in adenomas per colonoscopy



Detection of a 4-mm adenoma in the hepatic flexure by the computer-aided detection (CAde) device



Gastroenterology



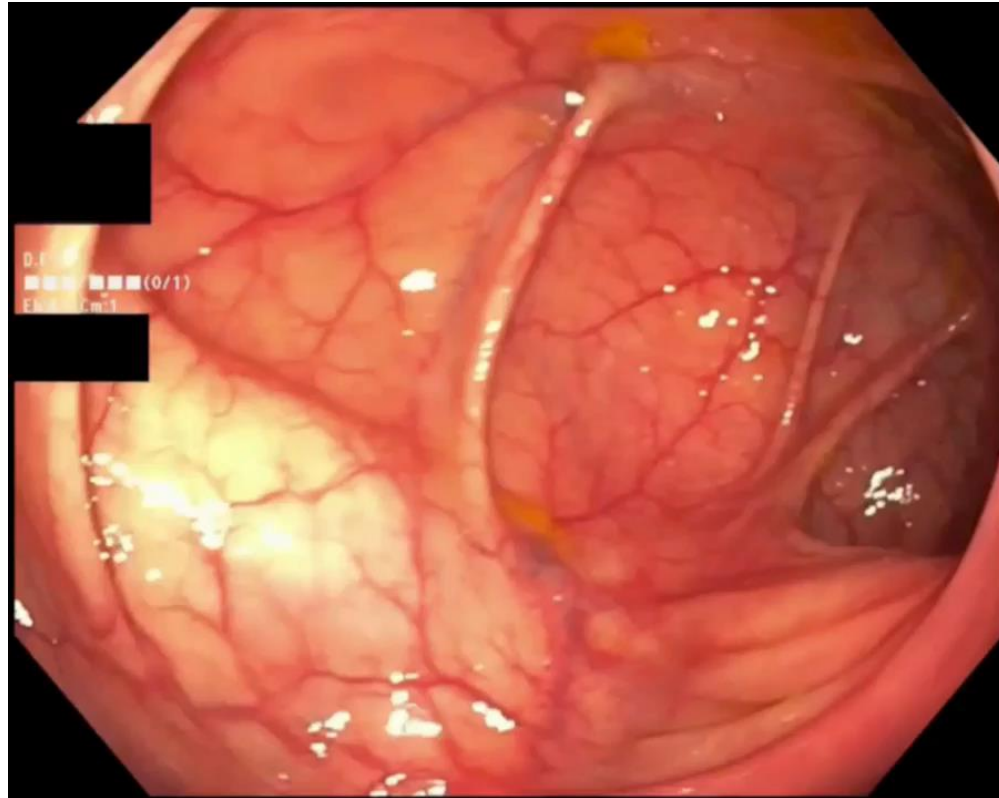


Image courtesy of Sushil Ahlawat, MD

# Conclusion

- Measurement of ADR is essential
- High-level ADR can be achieved with full knowledge of disease spectrum, split-dose bowel prep, and meticulous technique
- Low level detector should study disease spectrum and technique, use 1 or >adjunct devices or technology and re-measure ADR