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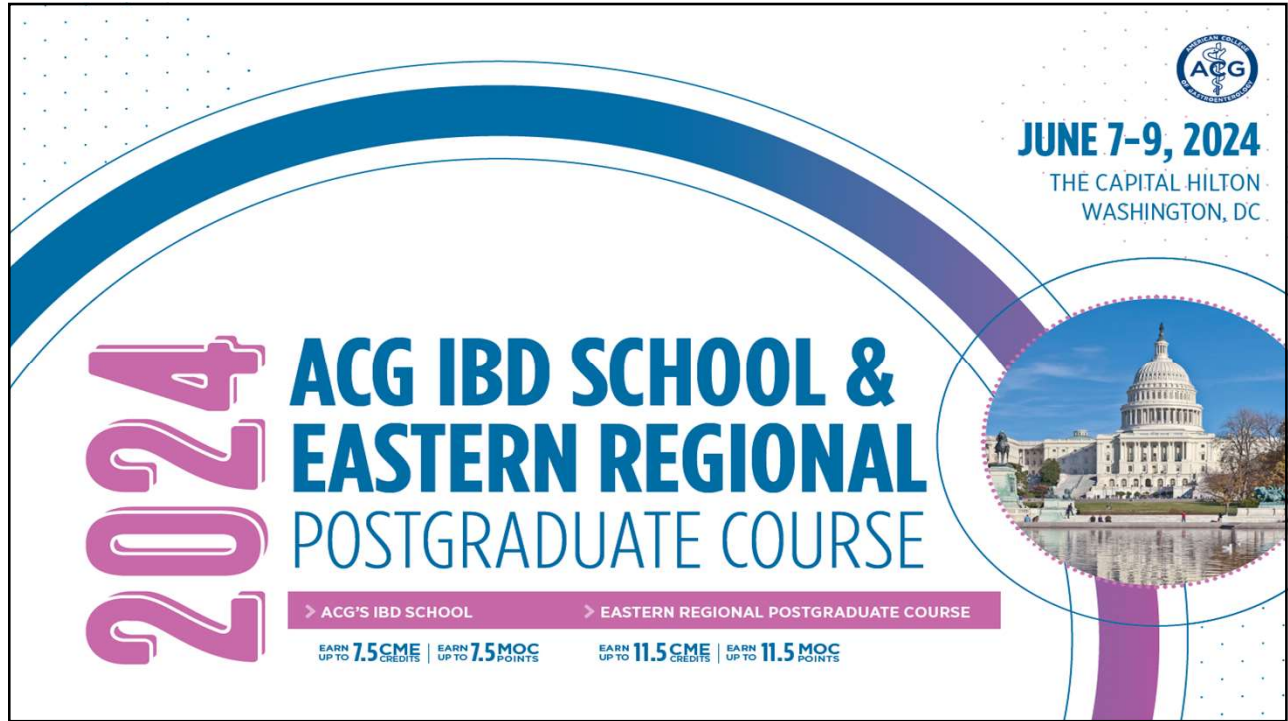
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*Special Issue:*  
**WELL-BEING**

JOY AND WELL-BEING IN THE PRACTICE  
OF MEDICINE - THE IMPORTANCE OF THE  
HUMAN CONNECTION

**ACG MAGAZINE**  
[BIT.LY/ACG-MAG-WELLBEING](http://BIT.LY/ACG-MAG-WELLBEING)

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ACG  
JUNE 7-9, 2024  
THE CAPITAL HILTON  
WASHINGTON, DC

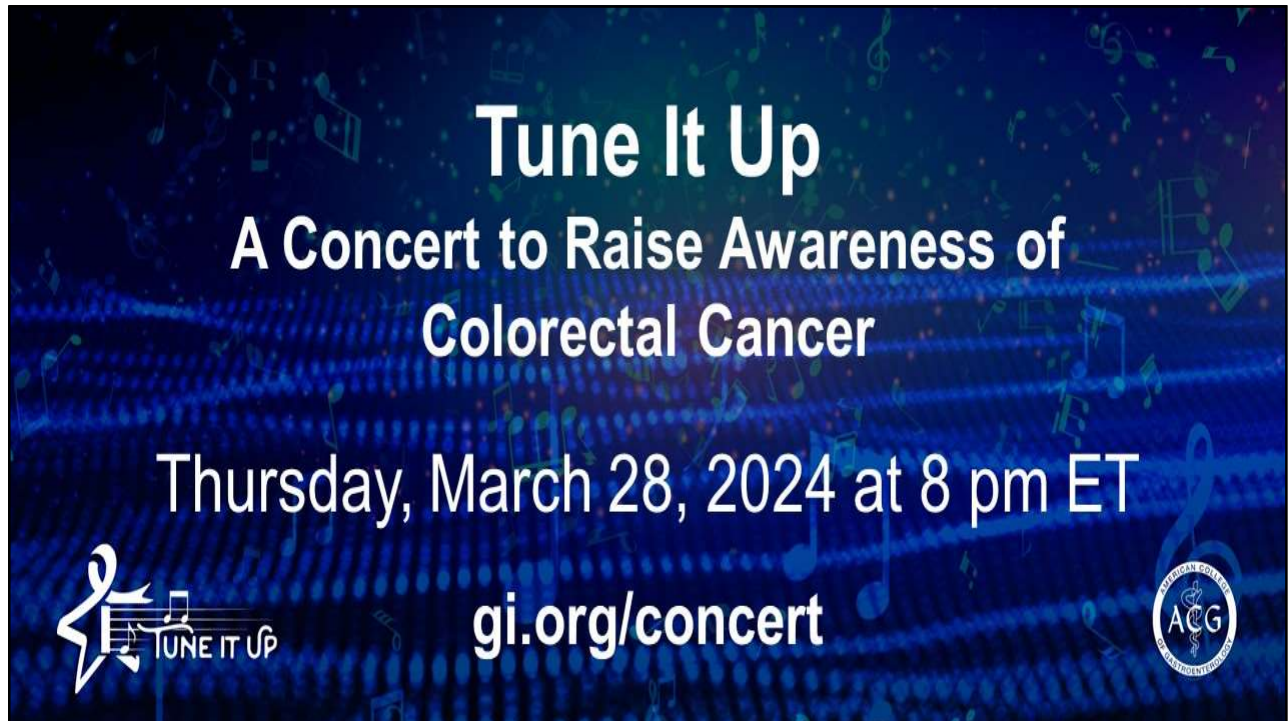
# 2024 ACG IBD SCHOOL & EASTERN REGIONAL POSTGRADUATE COURSE

> ACG'S IBD SCHOOL > EASTERN REGIONAL POSTGRADUATE COURSE

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# Tune It Up

## A Concert to Raise Awareness of Colorectal Cancer

Thursday, March 28, 2024 at 8 pm ET

[gi.org/concert](https://gi.org/concert)



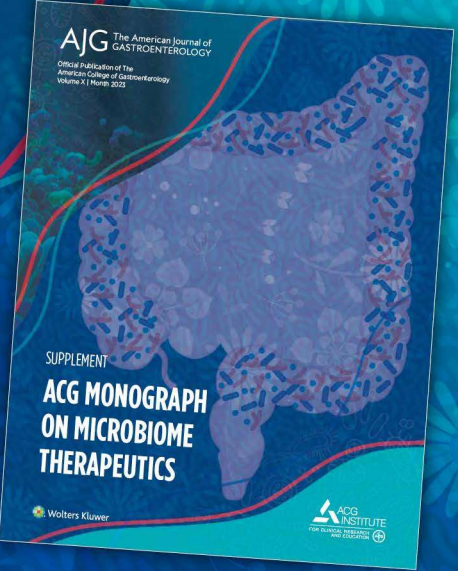
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**AJG** The American Journal of GASTROENTEROLOGY

# ACG MONOGRAPH ON MICROBIOME THERAPEUTICS

→ Currently available online and in print



Wolters Kluwer


ACG INSTITUTE FOR CLINICAL RESEARCH AND EDUCATION

Unrestricted educational grants to support the monograph have been provided to the ACG Institute for Clinical Research and Education from Nestlé Health Science and Seres Therapeutics and Ferring Pharmaceuticals Inc.

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## Participating in the Webinar




Moderator: James Tabibian, MD, PhD, FACG

All attendees will be muted and will remain in "Listen Only Mode"

Type your questions here so that the moderator can see them. Not all questions will be answered but we will get to as many as possible.

A handout with the slides and room to take notes can be downloaded from your control panel.



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## ACG Virtual Grand Rounds

Join us for upcoming Virtual Grand Rounds!



**Tune It Up**  
A Concert to Raise Awareness of  
Colorectal Cancer  
Thursday, March 28, 2024 at 8 pm ET  
[gi.org/concert](https://gi.org/concert)

Week 13 – Thursday, March 28, 2024: There will be no ACG Virtual Grand Rounds this week.

**Week 13 – Thursday, March 28, 2024:**  
“Tune It Up” Concert to Raise Awareness of Colorectal Cancer  
At 8pm Eastern

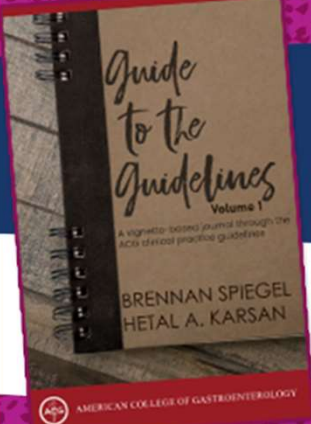
Week 14 – Thursday, April 4, 2024: There will be no ACG Virtual Grand Rounds this week.




**Week 15 – Thursday, March 14, 2024**  
Exocrine and Endocrine Complications of Pancreatitis  
Faculty: Ari Grinspan, MD, FACP and Olga Aroniadis, MD, MSc, FACP  
Moderator: Neil H. Stollman, MD, FACP  
At Noon and 8pm Eastern

Visit [gi.org/ACGVGR](https://gi.org/ACGVGR) to Register

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## Disclosures



**Mohit Girotra, MD, FACC:**

Dr. Girotra has no relevant financial relationships with ineligible companies.



**James Tabibian, MD, PhD, FACC:** Consultant for Guidepoint Global Advisors, Gerson Lehrman Group, Techspert, AlphaSights, DecioBio, Olympus Corporation, Ipsen, Atheneum, ClearView Healthcare Partners, Iota Biosciences, Pure Healthcare Strategy, and KeyQuest Health

*\*All of the relevant financial relationships listed for these individuals have been mitigated*

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## I see a large polyp during routine colonoscopy: How do I deal with it?



**Mohit Girotra, MD, FACC**

Gastroenterology & Interventional Endoscopy  
Swedish Medical Center, WA  
Associate Professor  
Washington State University, WA

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**March is COLORECTAL CANCER AWARENESS MONTH**

*Colorectal Cancer: You Can Prevent It.*

**COLORECTAL CANCER: You Can Prevent It**

**COLORECTAL CANCER PREVENTION by the Numbers**  
From the AMERICAN COLLEGE OF GASTROENTEROLOGY

**3RD** In the United States, colorectal cancer is the third most common cancer in both men and women, yet it is one of the most preventable types of cancer.

**1 in 23** Lifetime risk of colorectal cancer for men

**1 in 25** Lifetime risk of colorectal cancer for women

**150,000+** Estimated new cases of colorectal cancer this year

**50,000+** People will die from colorectal cancer this year

**1990** It has been estimated that people born around 1990 have twice the risk of colon cancer and four times the risk of rectal cancer than those born around 1950.

**SCREENING Saves Lives**

**AGE 45 TO 75** Adults at average risk for colorectal cancer should get screened.

**AGE 75+** The decision to continue screening should be individualized in adults over age 75.

**10 VS. 1** In general, colonoscopy every 10 years starting at age 45 for average risk adults is recommended as a screening test, as compared to the alternate stool FIT test which is only tested on average every 1 year.

**POLYPS** Removing polyps reduces the risk of colorectal cancer and saves lives. The power of prevention!

**1-STEP Test**  
COLONOSCOPY: Your doctor can see and remove any cancer-causing polyps and prevent cancer ALL IN ONE!  
FIT: A stool-based test that looks for hidden blood in your stool. You can do it at home. You can't see or remove polyps or prevent colorectal cancer.

**2-STEP Test**  
FIT: A stool-based test that looks for hidden blood in your stool. You can do it at home. You can't see or remove polyps or prevent colorectal cancer.  
OR  
Flexible sigmoidoscopy: A procedure that looks for polyps and removes them in your rectum and sigmoid colon. You can't see or remove polyps or prevent colorectal cancer.

**POSITIVE TEST**  
FIT  
2-STEP COLONOSCOPY

**RECOMMEND COLONOSCOPY**  
AS THE PREFERRED COLORECTAL CANCER PREVENTION TEST

**45 IS THE NEW 50!**

**YOU CAN PREVENT COLORECTAL CANCER**  
NEW SCREENING RECOMMENDATIONS FROM THE AMERICAN COLLEGE OF GASTROENTEROLOGY  
Digestive Disease Specialists  
Committed to Quality in Patient Care

GI.ORG

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## Colonoscopy = Gold standard

**Colonoscopy Reduces Colorectal Cancer Incidence and Mortality in Patients With Non-Malignant Findings: A Meta-Analysis**

Jun Pan, MD<sup>1,2</sup>, Lei Xin, MD<sup>1,3</sup>, Yi-Fei Ma, MD<sup>1,3</sup>, Liang-Hao Hu, MD<sup>1</sup> and Zhao-Shen Li, MD<sup>1</sup>

*Am J Gastroenterol* 2016; 111:355-365; doi:10.1038/ajg.2015.418; published online 12 January 2016

- 11 observational studies
- ~ 1.5 million patients
- Colonoscopy → 61% RR reduction in CRC incidence and mortality in patients with non-malignant findings

---

**Long-Term Colorectal-Cancer Incidence and Mortality after Lower Endoscopy**

Reiko Nishihara, Ph.D., Kana Wu, M.D., Ph.D., Paul Lochhead, M.B., Ch.B., Tepei Morikawa, M.D., Ph.D., Xiaoyun Liao, M.D., Ph.D., Zhi Rong Qian, M.D., Ph.D., Kentaro Inamura, M.D., Ph.D., Sun A. Kim, M.D., Ph.D., Aya Kuchiba, Ph.D., Mai Yamauchi, Ph.D., Yu Inamura, M.D., Ph.D., Walter C. Willett, M.D., Dr.P.H., Bernard A. Rosner, Ph.D., Charles S. Fuchs, M.D., M.P.H., Edward Giovannucci, M.D., Sc.D., M.P.H., Shuji Ogino, M.D., Ph.D., and Andrew T. Chan, M.D., M.P.H.

September 19, 2013  
N Engl J Med 2013; 369:1095-1105  
DOI: 10.1056/NEJMoa1301969

- > 88,000 patients followed over 22 years
- Colonoscopy vs No colonoscopy → multivariate hazard ratios for CRC 0.57 after polypectomy, 0.6 after negative sigmoidoscopy, and 0.44 after negative colonoscopy.

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## General Principles

- **Patient Assessment:**
  - Co-morbidities
  - Medications, including AT/AC
- **Consent:**
  - Standard colonoscopy consent
  - Resection consent
- **Endoscopy Team & Equipment**
  - Trained staff
  - Carbon Dioxide (for insufflation)
- **Patient Positioning:**
  - Prepare to change, when needed
- **Scope Positioning:**
  - Align working channel to lesion (6'o clock)
  - Retroflexion

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## Colon Polyp Management

- A) Lesion assessment:**
  - Size, Morphology, Pit pattern and SMI assessment
- B) Resection Planning:**
  - Resection Algorithm
  - Resection Tools
  - Resection Strategies
  - Resection Learning Curve
- C) Post-resection:**
  - Resection defect assessment/management
  - Resection margin treatment
  - Management of AEs (Bleeding, Perforation)
- D) Surveillance:**
  - Synchronous/Metachronous lesions
  - Evaluation of previous EMR site

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## A) Lesion Assessment: Polyp Morphology

### Paris Classification

Gastrointest. Endosc. 2003; Gastroenterol. 2020

SMI = 0.7-2.4% 27-36%

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## A) Lesion Assessment: Polyp Morphology

### Lateral Spread

**Granular**

“High risk” for superficial SMI

- LST-G nodular
- LST-NG pseudo-depression

**Non-Granular**

Overall LSTs:

- SMI ~ 8.5% (NG 11.7% vs G 5.9%)
- HGD ~ 36%

Gastrointest Endosc. 2020

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## A) Lesion Assessment: Polyp Surface Pattern

NICE

	Type 1	Type 2	Type 3
<b>Color</b>	Same or lighter than background	Browner relative to background (verify color arises from vessels)	Brown to dark brown relative to background; sometimes patchy whiter areas
<b>Vessels</b>	None, or isolated lacy vessels may be present coursing across the lesion	Brown vessels surrounding white structures**	Has area(s) of disrupted or missing vessels
<b>Surface pattern</b>	Dark or white spots of uniform size, or homogeneous absence of pattern	Oval, tubular, or branched white structures** surrounded by brown vessels	Amorphous or absent surface pattern
<b>Most likely pathology</b>	Hyperplastic and sessile serrated lesions***	Adenoma****	Deep submucosal invasive cancer

Japan Narrow Band Imaging Expert Team (JNET)

	Type 1	Type 2A	Type 2B	Type 3
<b>Vessel pattern</b>	*Invisible†	*Regular caliber *Regular distribution (meshed/spiral pattern)‡	*Variable caliber *Irregular distribution	*Loose vessel areas *Interruption of thick vessels
<b>Surface pattern</b>	*Regular dark or white spots *Similar to surrounding normal mucosa	*Regular (tubular/branched/papillary)	*Irregular or obscure	*Amorphous areas
<b>Most likely histology</b>	Hyperplastic polyp/ Sessile serrated polyp	Low grade intramucosal neoplasia	High grade intramucosal neoplasia/ Shallow submucosal invasive cancer‡	Deep submucosal invasive cancer
<b>Endoscopic image</b>				

Type 1 refers to hyperplastic polyps and sessile serrated polyps.  
 Type 2A refers to LGIN and type 2B corresponds to HGIN or shallow submucosal invasive cancer (S-SMC).  
 Type 3 refers to deep submucosal invasive cancer (D-SMC).

Hirata D, Kashida H, Iwatate M, et al. Effective use of the Japan Narrow Band Imaging Expert Team classification based on diagnostic performance and confidence level. *World J Clin Cases.* 2019;7(18):2658–2665.

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## A) Lesion Assessment: Polyp Surface Pattern

### Kudo Pit Pattern

**I**

Round pits (normal)

**II**

Stellate pits

**III<sub>s</sub>**

Tubular or round pits that are smaller than the normal pits (type I)

**III<sub>L</sub>**

Tubular or round pits that are larger than the normal pits (type I)

**IV**

Dendritic or gyrus like pits

**V<sub>i</sub>**

Irregular arrangement and sizes of pits

**V<sub>n</sub>**

Loss or decrease of pits with an amorphous structure

- Kudo I – IV = Benign → Endoscopically managed.
- Kudo V = Amorphous, non-structured pit pattern → Indicative of deep SMI or CRC → need Surgery.

Kudo et al. J Clin Path 1994

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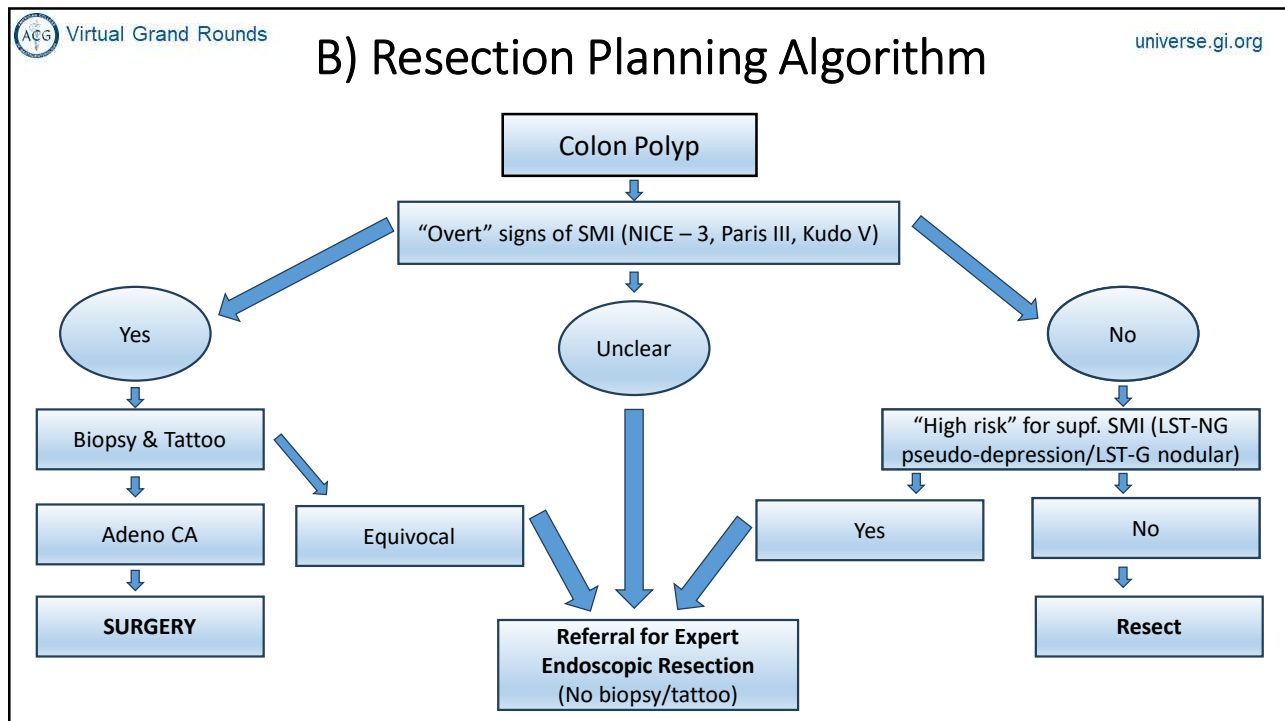
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## A) Lesion Assessment: Sub-mucosal Invasion (SMI)

Lesion Type	Risk of SMI
Homogenous O-IIa G	<2%
O-IIa + Is G	6-10%
Homogenous O-IIa NG	10-15%
O-IIa + IIc NG	45-70%

Klein A, Bourke MJ. Gastrointest Endosc Clin N Am 2015

19



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## B) Resection Strategies

### Cold Snare Resection (CSR):

- Transection with shearing force, without electrocautery
- Stiff, thin-wire (< 0.3 mm) snare
- With or without submucosal injection
- Capture lesion + 2-3 mm of healthy margin
- En-bloc or Piece-meal
- Post resection defect inspection

### Endoscopic Mucosal Resection (EMR):

- Marking (optical or mechanical)
- Submucosal lift w/ chromoinjectate
- Tissue resection with 2-3 mm rim of healthy margin
- Inject-Lift-Cut-Repeat

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## B) Resection Strategies

### Underwater EMR:

- Replacing air/CO<sub>2</sub> in colonic lumen with sterile water or natural saline
- Decreased tension in wall of colon → “floating” effect provides natural separation of mucosa and submucosa from muscularis propria
- Sessile/flat lesions become more contracted & polypoid
- Performance of resection without submucosal lift

### Endoscopic Submucosal Dissection (ESD):

- Generous submucosal injection → mucosal incision → sub-lesional dissection in submucosal plane with electrosurgical knife w/insulated tip → resection
- Modifications: internal & external traction devices
- Hemostatic management of large submucosal vessels
- Learning curve

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## Surgery for benign adenomas

### Morbidity and Mortality After Surgery for Nonmalignant Colorectal Polyps

#### A 10-Year Nationwide Analysis

Ma, Christopher MD, MPH<sup>1,2</sup>; Teriaky, Anouar MD, MPH<sup>3</sup>; Sheh, Steven MD<sup>4</sup>; Forbes, Nauzer MD, MSc<sup>1,5</sup>; Heitman, Steven J. MD, MSc<sup>1,5</sup>; Jue, Terry L. MD<sup>4</sup>; Munroe, Craig A. MD<sup>4</sup>; Jairath, Vipul MD, PhD<sup>2,3,6</sup>; Corley, Douglas A. MD, MPH, PhD<sup>4,7</sup>; Lee, Jeffrey K. MD, MPH, MAS<sup>4,7</sup>

American Journal of Gastroenterology: November 2019 - Volume 114 - Issue 11 - p 1802–1810

- National Inpatient Sample 2005-2014
- > 262,843 surgeries for non-malignant colorectal polyps.
- **In-hospital mortality 0.8%, morbidity 25.3%**
- Mortality by age:
  - 0.2% in 50-59 y/o
  - 0.6% in 60-69 y/o
  - 1.0% in 70-79 y/o
  - 2.5 % in 80 and greater
- In patients developing a postoperative adverse event:
  - 106% increase in mean hospital LOS (10.3 vs 5.0 days; P < 0.0001)
  - 91% increase in mean hospitalization cost (\$77,015.24 vs \$40,258.30; P < 0.0001).

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## What's new in colon polypectomy?

1. Non-pedunculated adenomas < 10 mm = Cold Snare (forceps removal ok for tiny  $\leq$  3mm)
2. Non-pedunculated adenomas 10-19 mm = Cold Snare
3. Non-pedunculated polyps  $\geq$  20mm = ESD (vs. EMR)
4. Non-dysplastic serrated lesions (of any size) = Cold Snare
5. What about EMR? Post-EMR follow-up exams

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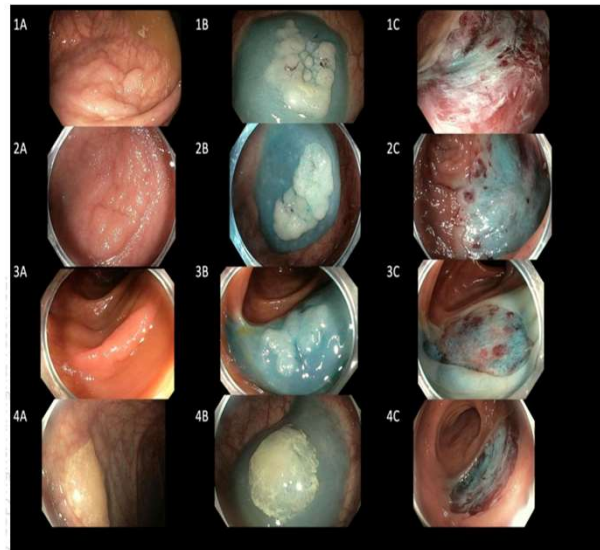
## 1) Non-pedunculated Adenomas

1. Adenoma < 10mm = Cold snare preferred (forceps removal ok for tiny  $\leq$  3mm  
→ One-device colonoscopy)
2. 2023: data demonstrate high efficacy and safety of CSP for 10-19 mm
  - ❖ Caveat: Examine polyp carefully. Reconsider if concern for early cancer (e.g. JNET 2B or polypoid portion arising within flat polyp or Kudo V)
3. Cold snare can be done with or without submucosal injection. Typically piecemeal when  $\geq$  10mm
  - Very safe: Low risk of bleeding, clips generally not needed, some patients may get pain from epinephrine injection

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## Nonpedunculated 10-19 mm Polyps = CSP

- Multicenter (Australia x 7), Prospective single arm study
- Exclude pedunculated, non-pedunc with >10mm ls component, endoscopic features of malignancy \*\*
- 87% submucosal injection.
- 28% en bloc, 72% piecemeal
- Purposely attempt to resect polyp with a margin of normal mucosa
- 4-8 biopsies of margin (4 for en bloc polypectomy) + biopsy middle



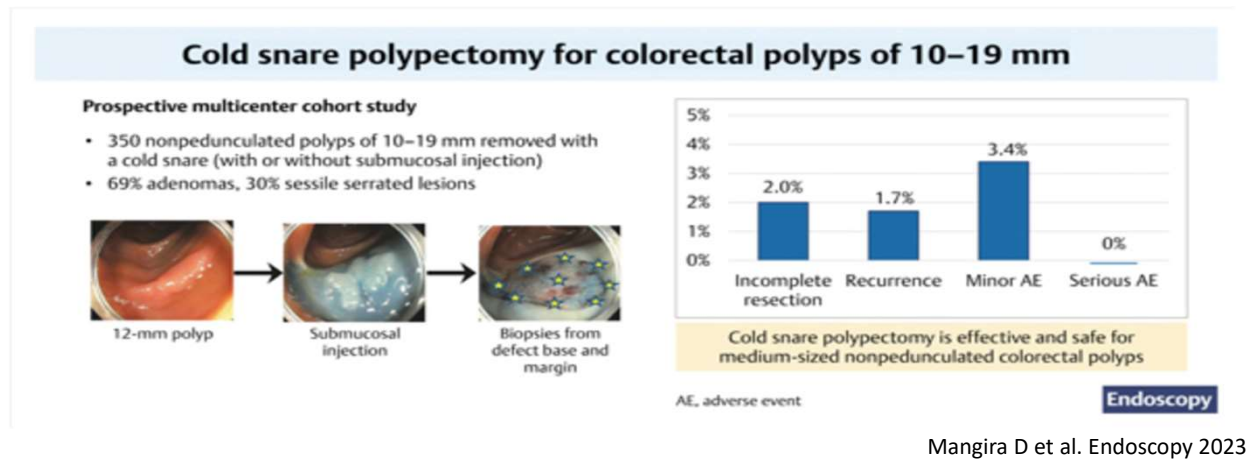
Mangira D et al. Endoscopy 2023

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## Cold Snare 10-19 mm Results

- 350 Polyps (295 Patients): Median 15 mm
- 69% Adenoma (4.6% HGD), 26% SSL without dysplasia, 3.8% SSL with dysplasia, 1.4% hyperplastic



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## Cold vs. Hot Snare With or Without Injection

- Randomized trial for non-pedunculated 6-15 mm lesions:
  - 3 Centers, 235 Patients, 286 Polyps (157 x 6-9mm, 129 x 10-15mm)
  - 4 groups- cold snare (CS), CS + injection (INJ), hot snare (HS), HS + INJ
  - Immediately after resection biopsy margin x 4 and center x 1

	6-9 mm	10-15 mm
<b>CS</b>	0	0/27
<b>CS + INJ</b>	0	0
<b>HS</b>	0	3% (1/29)
<b>HS + INJ</b>	6% (2/35)	13% (4/35)

Rex DK et al. Gastrointest Endosc 2022

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## 2) Large Pedunculated Polyps

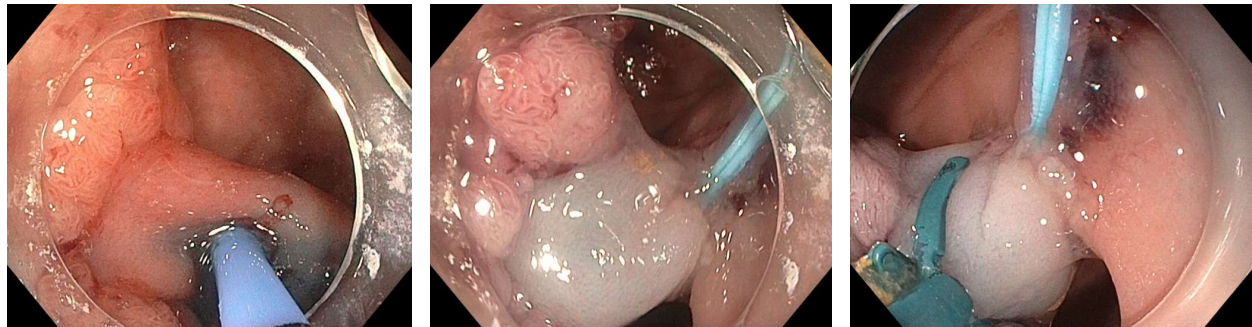


- Hot Snare Polypectomy for  $\geq 10$  mm
- Prophylactic mechanical ligation of the stalk with a detachable loop or clips for pedunculated lesions with a head size  $\geq 20$  mm or stalk thickness  $\geq 5$  mm.
- Transection should be at the middle to lower stalk in order to provide adequate specimen for histologic assessment of stalk invasion.
- Retrieval of large pedunculated polyp specimens en bloc to ensure ability to assess resection margins

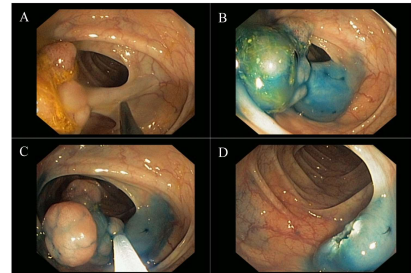
ASGE Practice Guideline. GIE 2020

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## Large Pedunculated Polyps



- Submucosal injection underneath the stalk (Lifting agent + 1:10,000 Epi).
- Epi injection into head and stalk – To shrink large polyps (> 3 cm).
- Prophylactic mechanical ligation of the stalk.
- Stalk resection: Hot snare or electrocautery knife.



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## Haggitt Classification

The diagram illustrates the Haggitt Classification of adenocarcinoma. On the left, a vertical cross-section shows the layers of the colon wall: Level 0 (adenocarcinoma in situ), Level 1 (adenocarcinoma invading through the muscular mucosae into the submucosa), Level 2 (invasion into the neck of the stalk), Level 3 (invasion into the stalk), and Level 4 (invasion into the bowel wall beyond the stalk). Labels include 'adenocarcinoma', 'Adenomatous Epithelium', 'Normal colonic mucosa', 'Muscularis mucosae', 'Submucosa', 'Muscularis Propria', and 'Subserosal connective tissue'. On the right, three diagrams labeled Sm<sub>1</sub>, Sm<sub>2</sub>, and Sm<sub>3</sub> show the depth of adenocarcinoma invasion into the submucosa, with Sm<sub>1</sub> being the shallowest and Sm<sub>3</sub> being the deepest.

LN involvement:

- Pedunculated Haggitt 0-3; Favorable histo = 0.3%
- Haggitt 4; Unfavorable histo; Sessile SM3 = 12-25%

Level 0 = Carcinoma in-situ or Intramucosal Carcinoma  
 Level 1 = AdenoCA invading through MM into SM; Limited to Head  
 Level 2 = Invasion into Neck  
 Level 3 = Invasion into stalk  
 Level 4 = Invasion into bowel wall, beyond the stalk; Limited to SM (All sessile polyps = Level 4)

Haggitt et al. Gastroenterol. 1985

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## 3) Serrated Lesions (SSL)

- Dysplasia is uncommon: 1-3% even in SSL  $\geq$  2cm
- SSL without concerning endoscopic features = usually non-dysplastic
- SSL are commonly found in the R colon, where post-resection bleeding and perforation are significant concerns
- Most SSL are flat and not fibrotic  $\rightarrow$  easily removed by piecemeal CSP

Tutticci N, Hewett D. Gastrointest Endosc 2017  
Barros R et al. Endosc Int Open 2021

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## SSL: CSP vs. EMR

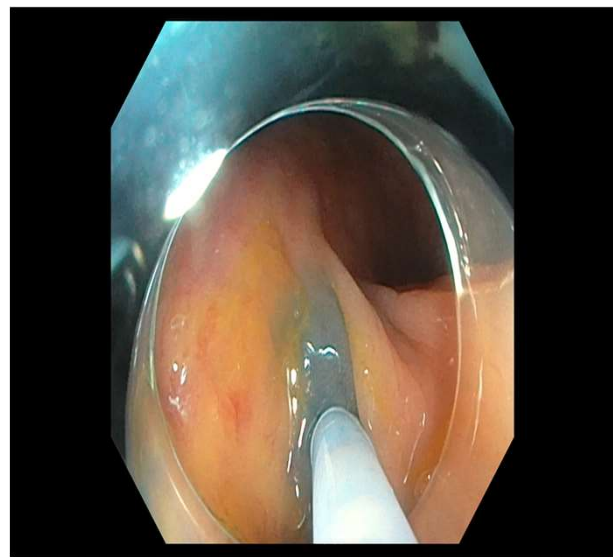
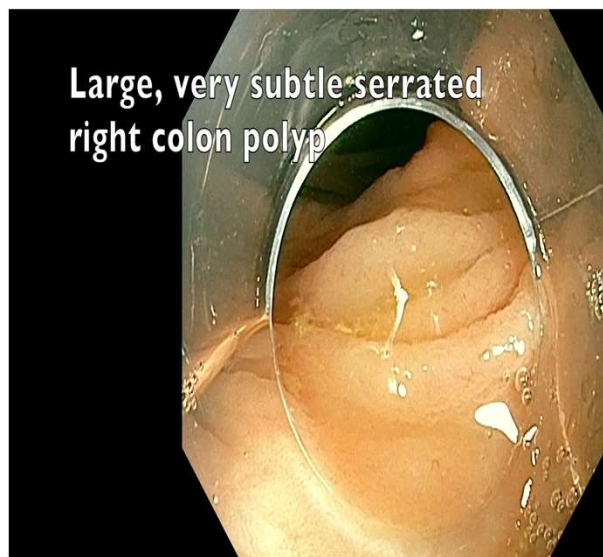
- Comparison of  $\geq 20\text{mm}$  SSL resected at 4 Australian centers by EMR (until 4/2016) vs CS with Injection (since 4/2016)
  - 12 lesions in CS era treated by EMR due to suspected dysplasia/cancer.

Van Hattem et al. Gut 2021;70:1691

	EMR (until Apr 2016)	CSP (April 2016 onwards) Technical	
Technical Success	99% (402/406)	100% (156/156)	
Recurrence Rates at 1 <sup>st</sup> FUV	4.6%	4.3%	P = NS
Delayed Bleeding	5.1%	0	P < 0.01
Muscle Injury	2.8%	0	P = 0.07

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## CSP of Large SSLs



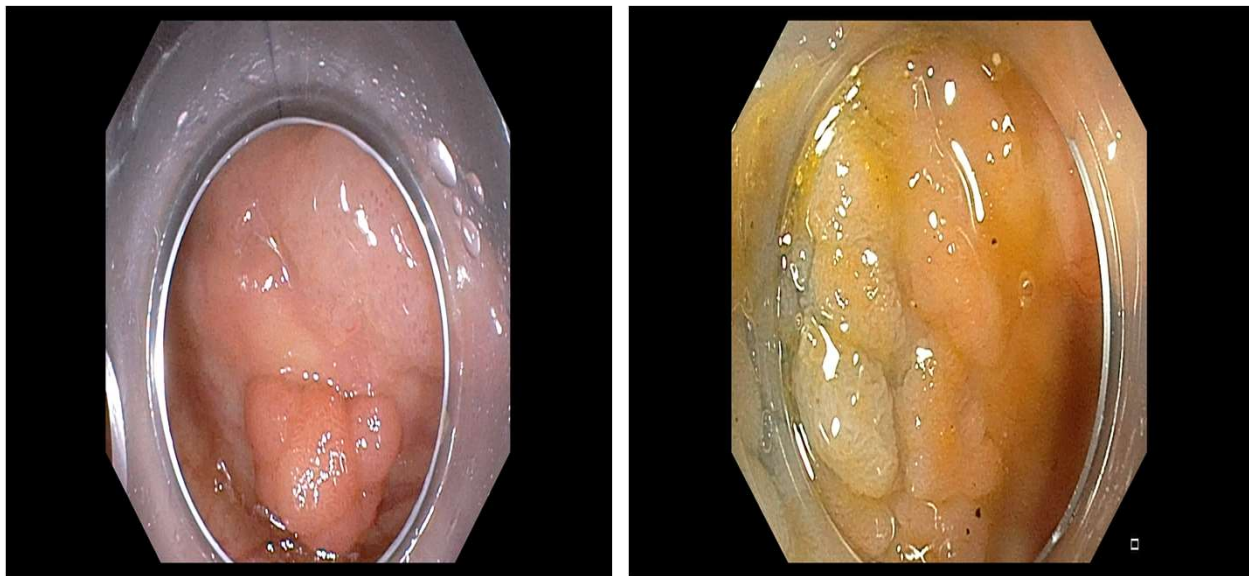
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## Pitfalls with Serrated Lesions

- Margins = subtle → Injection with saline (or hetastarch) + blue dye can help visualization.
- SSL = Often larger than you think – delineation is important.
- Fibrosis from prior treatment is difficult to manage - best time to abort is before any cutting (ok if you injected saline)
- Even prior biopsies cause significant fibrosis - it's manageable but best to limit to 1 biopsy
- Examine very carefully for e/o dysplasia - typically looks like one part of polyp is an adenoma surrounded by serrated changes

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## SSLs with dysplasia or adenomatous portions



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## 4) Polyps $\geq$ 20mm EMR vs ESD

- 6 centers in France, 11 endoscopists, 359 patients
- **> 25mm** lesions (Excluded II-c, nongranular pseudo-depressed and rectal for ethical reasons)

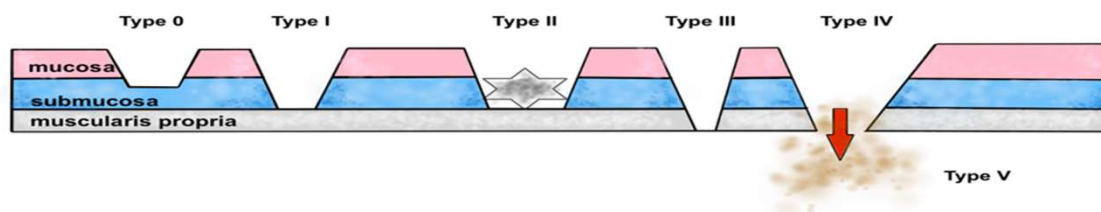
	EMR	ESD	
<b>R0 Resection</b>	12%	94%	<b>P &lt; 0.001</b>
Superficial Submucosal CA	0.5%	3.5%	P = 0.08
Deep Submucosal CA	3.8%	4%	P = NS
<b>Recurrence at 6 m</b>	5.1%	0.6%	<b>P = 0.02</b>
Delayed bleeding	5.5%	7.9%	P = NS
Surgery for Complications	0%	1%	P = NS
Duration	71 min	113 min	P < 0.001

- ❑ ESD safe, superior to EMR. **Pathology exam on piecemeal specimen likely misclassifies 6/7 superficial cancers as benign adenomas**

Jacques J et al, DDW 2022

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## C) Post Resection: Defect Inspection



### Sydney Classification of Deep Mural Injury (DMI) following EMR

<b>Type 0</b>	Normal defect. Blue mat appearance of obliquely oriented intersecting submucosal connective tissue fibres.
<b>Type I</b>	MP visible, but no mechanical injury.
<b>Type II</b>	Focal loss of the submucosal plane raising concern for MP injury or rendering the MP defect uninterpretable.
<b>Type III</b>	MP injured, specimen target or defect target identified
<b>Type IV</b>	Actual hole within a white cautery ring, no observed contamination
<b>Type V</b>	Actual hole within a white cautery ring, observed contamination

Burgess NG & Bourke MJ. Gut 2017

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## C) Post Resection: Defect Inspection

Burgess NG & Bourke MJ. Gut 2017

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## C) Post Resection Deep Mural Injury (DMI)

- All comers, all polyp types = Intraprocedural perforation ~ 0.5% and clinically significant perforation occurs in 0.2%.
- Potential DMI (type I and II) = associated with increasing lesion size, SMF and transverse colon location.
- **DMI type III–V: (target signs and perforations, overall frequency ~ 3%) = associated with en bloc resection (esp ≥ 25 mm), transverse colon location and HGD or SMIC.**

☐ Management:

- DMI Type I = No clip placement
- DMI type III–V require closure of the injured MP (also DMI type II)
- DMI type III (Target sign) = same day discharge if they are well and the injury is securely closed

Burgess NG & Bourke MJ. Gut 2017

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## C) Post Resection: EMR Margin Ablation

*Gastroenterology*, 2019 Feb;156(3):604-613.e3. doi: 10.1053/j.gastro.2018.10.003. Epub 2018 Oct 6.

### **Thermal Ablation of Mucosal Defect Margins Reduces Adenoma Recurrence After Colonic Endoscopic Mucosal Resection.**

Klein A<sup>1</sup>, Tate DJ<sup>2</sup>, Jayasekeran V<sup>1</sup>, Hourigan L<sup>3</sup>, Singh R<sup>4</sup>, Brown G<sup>5</sup>, Bahin FF<sup>2</sup>, Burgess N<sup>2</sup>, Williams SJ<sup>1</sup>, Lee E<sup>1</sup>, Sidhu M<sup>1</sup>, Byth K<sup>6</sup>, Bourke MJ<sup>7</sup>.

- Prospective RCT at 4 Australian referral centers
- 390 patients with large LSP ( $\geq 20$  mm, n = 416) referred for EMR
- Ablation of the post-EMR mucosal defect margin (n = 210) or no additional treatment (controls, n = 206).
- Surveillance colonoscopies with standardized photo documentation & scar Bx ~ 6 months.

#### **Recurrence at 1<sup>st</sup> surveillance:**

- Ablation group (10/192 = **5.2%**), vs. controls (37/176 = **21%**); p < 0.001
- Relative risk of recurrence in thermal ablation group = 0.25 compared with control group

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## C) Post Resection: Clip closure after Large EMR

*Gastroenterology*, 2019 Oct;157(4):977-984.e3. doi: 10.1053/j.gastro.2019.03.019. Epub 2019 Mar 15.

### **Clip Closure Prevents Bleeding After Endoscopic Resection of Large Colon Polyps in a Randomized Trial.**

Pohl H<sup>1</sup>, Grimm IS<sup>2</sup>, Moyer MT<sup>3</sup>, Hasan MK<sup>4</sup>, Pleskow D<sup>5</sup>, Elmunzer BJ<sup>6</sup>, Khashab MA<sup>7</sup>, Sanaei O<sup>7</sup>, Al-Kawas FH<sup>8</sup>, Gordon SR<sup>9</sup>, Mathew A<sup>2</sup>, Levenick JM<sup>2</sup>, Aslanian HR<sup>10</sup>, Antaki F<sup>11</sup>, von Renteln D<sup>12</sup>, Crockett SD<sup>2</sup>, Rastogi A<sup>13</sup>, Gill JA<sup>14</sup>, Law RJ<sup>15</sup>, Elias PA<sup>6</sup>, Pellise M<sup>16</sup>, Wallace MB<sup>17</sup>, Mackenzie TA<sup>18</sup>, Rex DK<sup>19</sup>.

- Multi-centric RCT in the US
- Clip vs. No clip. >20 mm polyp
- Post-procedure bleeding occurred in **3.5%** in clip group and **7.1%** in no-clip group
- Clip closure was protective against bleeding & more so on the right colon

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## A Case study... 55 y/o M 2-3 cm sigmoid polyp

CSP + Tattoo      Recurrence 6m

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## 4) Post-EMR Follow-up

1 yr after 3<sup>rd</sup> Rx      1 yr after 4<sup>th</sup> Rx

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## EMR Scar: Optical diagnosis vs pathology

Endoscopic scar assessment after colorectal endoscopic mucosal resection scars: when is biopsy necessary (EMR Scar Assessment Project for Endoscope (ESCAPE) trial)

Pujan Kandel<sup>1</sup>, Eelco Christiaan Brand<sup>2</sup>, Joe Pelt<sup>1</sup>, Colleen T Ball<sup>3</sup>, Wei-Chung Chen<sup>1</sup>, Ernest P Bouras<sup>1</sup>, Victoria Gomez<sup>1</sup>, Massimo Raimondo<sup>1</sup>, Timothy A Woodward<sup>1</sup>, Michael B Wallace<sup>1</sup> the EMR SCAR Group

**Table 2** Diagnostic values for optical diagnosis of residual neoplasia during EMR follow-up\*

All EMR sites, n=255	HD-WL	HD-WL with NF	NBI	NBI with NF
NPV	96.8 (93.2 to 98.5)	97.3 (93.8 to 98.8)	97.3 (93.9 to 98.9)	97.8 (94.6 to 99.2)
PPV	84.8 (74.3 to 91.6)	81.4 (70.8 to 88.8)	83.8 (73.3 to 90.7)	82.9 (72.4 to 89.9)
Sensitivity	90.3 (80.4 to 95.5)	91.9 (82.5 to 96.5)	91.9 (82.5 to 96.5)	93.5 (84.6 to 97.5)
Specificity	94.8 (90.7 to 97.2)	93.3 (88.8 to 96.0)	94.3 (90.1 to 96.8)	93.8 (89.4 to 96.4)
Accuracy	93.7 (90.1 to 96.1)	92.9 (89.1 to 95.5)	93.7 (90.1 to 96.1)	93.7 (90.1 to 96.1)
High confidence diagnosis, no. (%)	209 (82.0)	212 (83.1)	212 (83.1)	233 (91.4)
NPV	98.1 (94.7 to 99.4)	98.8 (95.6 to 99.7)	98.8 (95.6 to 99.7)	100 (97.8 to 100)
PPV	91.7 (80.4 to 96.7)	90.0 (78.6 to 95.7)	89.8 (78.2 to 95.6)	86.9 (76.2 to 93.2)
Sensitivity	93.6 (82.8 to 97.8)	95.7 (85.8 to 98.8)	95.7 (85.5 to 98.8)	100 (93.2 to 100)
Specificity	97.5 (93.8 to 99.0)	97.0 (93.1 to 98.7)	97.0 (93.1 to 98.7)	95.6 (91.5 to 97.7)
Accuracy	96.7 (93.2 to 98.4)	97.0 (93.3 to 98.4)	96.7 (93.3 to 98.4)	96.6 (93.4 to 98.3)

\*Value (95% Wilson CI) unless otherwise noted.

EMR, endoscopic mucosal resection; HD-WL, high-definition white light imaging; NBI, narrow-band imaging; NF, near focus; NPV, negative predictive value; PPV, positive predictive value.

Kandel P, et al. *Gut* 2019;68:1633–1641. doi:10.1136/gutjnl-2018-316574

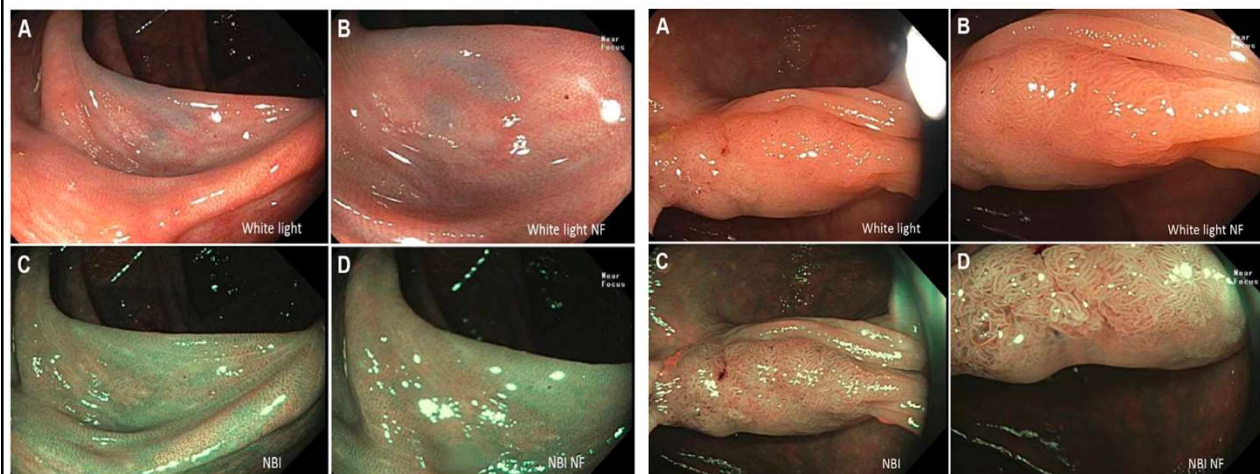
1637

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## EMR Scars

No recurrence

Recurrence



Kandel P et al. *Gut* 2019

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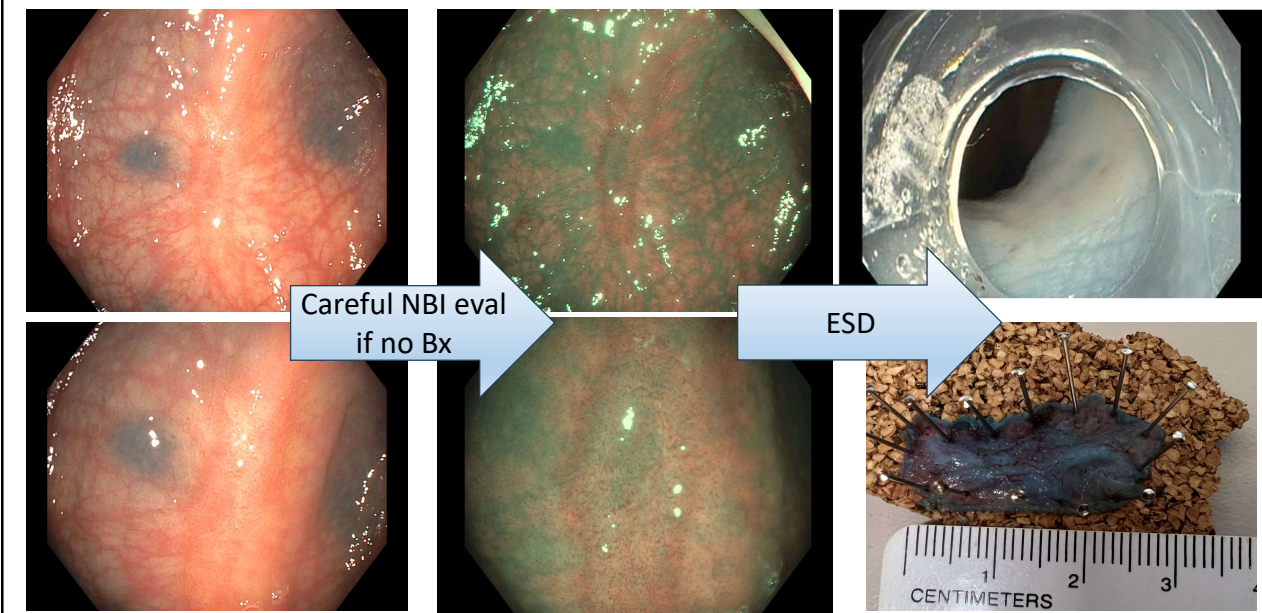
## Examining post-polypectomy scars

1. Wash and inspect entire scar at close range.
2. Examine with multiple endoscopic imaging modes (e.g. WLE, NBI, near focus).
3. Post clipping artifacts (small bumps with normal mucosa) common.
4. With experience, if confident about no recurrence → biopsy is not necessary.
5. If you are not confident → then biopsy
6. If confident there is a recurrence → can either biopsy to confirm or treat the recurrence.

Kandel P et al. Gut 2019

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## After 4 years (10 yrs from initial resection)



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## Take Home Messages reg polyps > 20 mm

1. ESD > Piecemeal EMR.
2. ESD: En bloc resection of  $\leq 5$ cm lesions and some larger lesions.
3. Issues with Piecemeal EMR = Incomplete resection, Recurrence ( $\sim 10$ -20% i.e. 10 times higher than ESD), misdiagnoses early cancer as adenoma.
4. ESD is effective for early cancers  $\rightarrow$  surgery safely avoided for well differentiated cancers with superficial submucosal invasion.
5. Meticulous eval of scar  $\rightarrow$  Bx is equivocal  $\rightarrow$  ESD possible despite fibrosis.

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## Tattooing

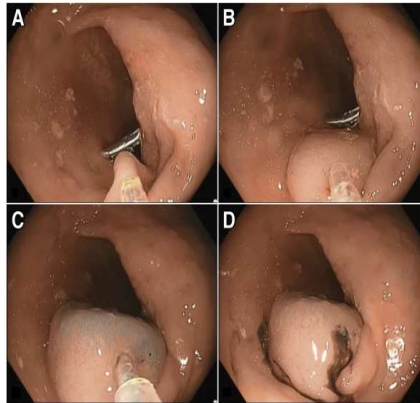
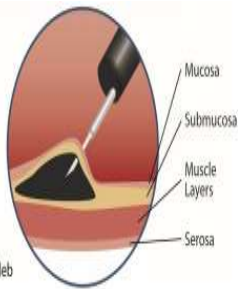
- Tattoo = a suspension of highly purified and fine carbon particles that are sterile and biocompatible, although not biologically inert.
- Endoscopic Resection:** Tattoo 2–3 separate sites located 3–5 cm anatomically distal to the lesion (anal side) (*Strong recommendation, low-quality evidence*).
- Surgery:** Targeted in line with the lesion as well as with the opposite lumen wall from the lesion to increase the likelihood that the tattoo will be seen during surgery.
- Endoscopists & surgeons establish a standard location of tattoo injection relative to the colorectal lesion.
- Documentation: Details of the tattoo injection (ie, material, volume, position relative to the lesions) + photo documentation of the tattoo in relation to the lesion.

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## Submucosal Bleb Technique

- Saline into submucosal space → Tattoo (0.5-1 cc)
- Prevents serosal/peritoneum injection
- Minimizes percolation under polyp causing submucosal fibrosis

1. Prime needle with saline
2. Advance needle through endoscope
3. Approach and insert needle into mucosa at an oblique angle
4. Create saline bleb (to reduce risk of transmural injection)
5. Inject 0.5-1 ml of tattoo per bleb



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## 2024 Summary: If I Find a Large Polyp

- Spend time to examine polyp carefully before deciding management strategy:
  - Does the polyp have a significant risk of cancer?
  - Can I see all of the margins clearly?
  - Can I remove it completely?
- CSP = Safe and effective for non-pedunculated adenomas < 2cm and for larger serrated polyps without worrisome features.
- For lesions with worrisome features, fibrosis, lesions ≥ 2cm = ESD (availability permitting > Piecemeal EMR).
- Post-resection margin ablation = Decreases recurrence rates
- Post-resection clip closure = Decreases bleeding rates
- Scar follow-up → up and close with multiple imaging modalities and biopsy if unsure about recurrence.

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Thank you

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## Questions



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