



# Endoscopy in IBD: Challenges in Resource-Limited Settings

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Professor of Gastroenterology

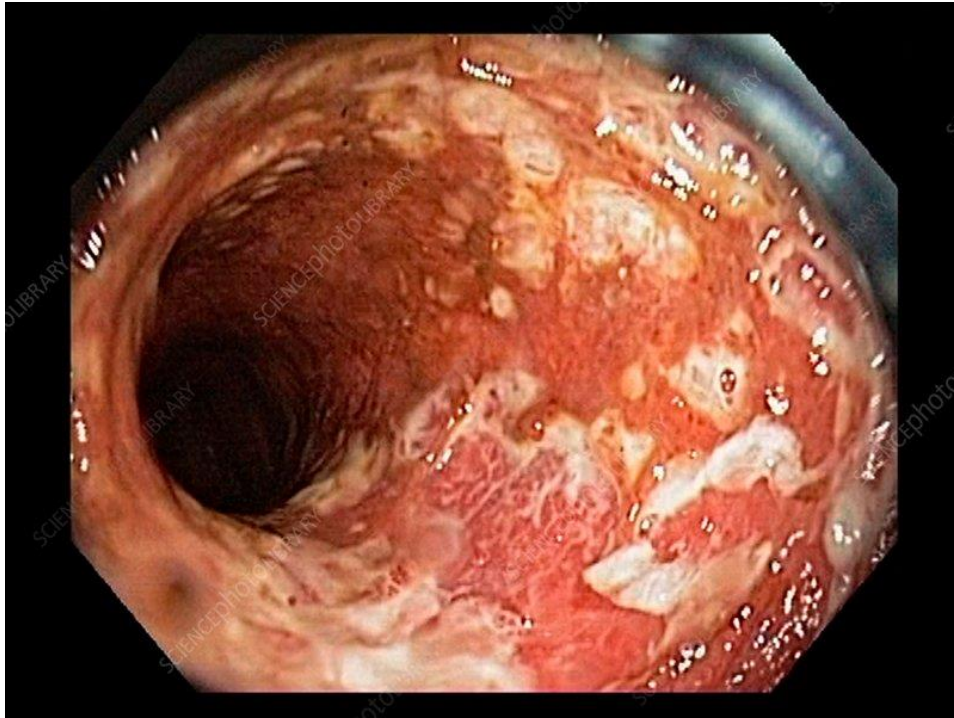
Director of the Integrated Clinical & Research Center for Intestinal  
Disorders



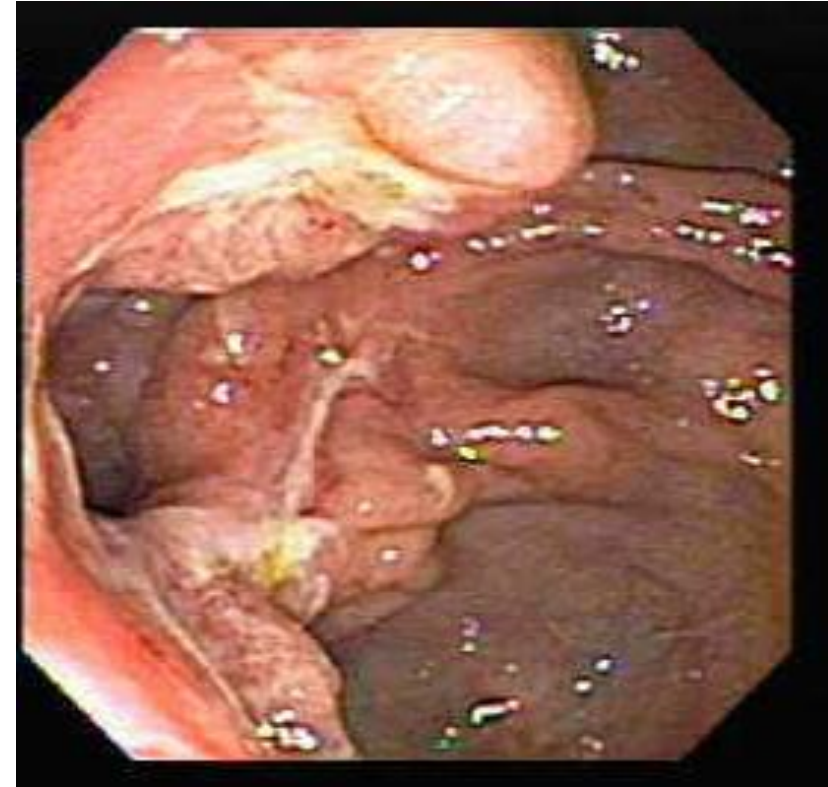
- Diagnosis of IBD
- Assessment of Disease Activity
- Screening for Dysplasia
- Management of Dysplasia



# Diagnosis of IBD

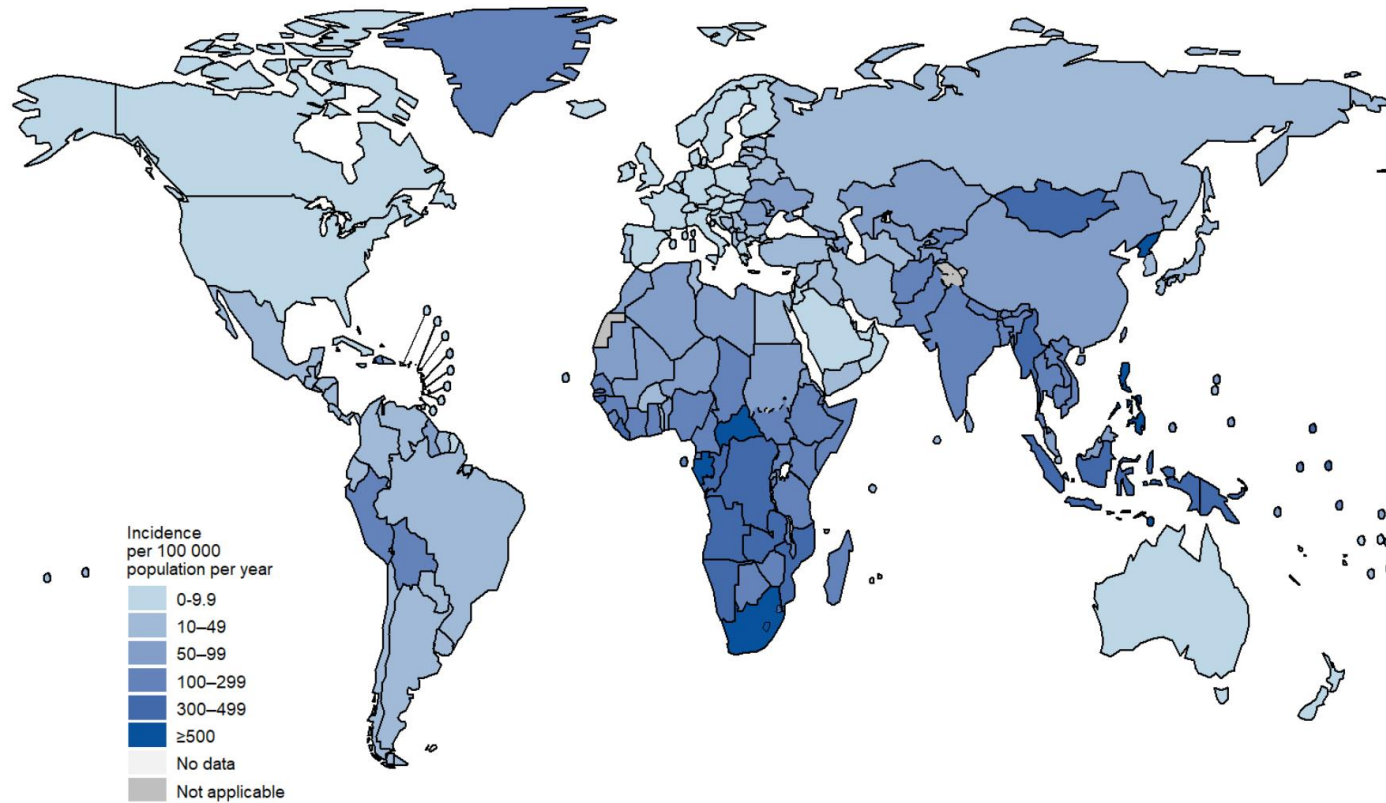


Ulcerative  
colitis

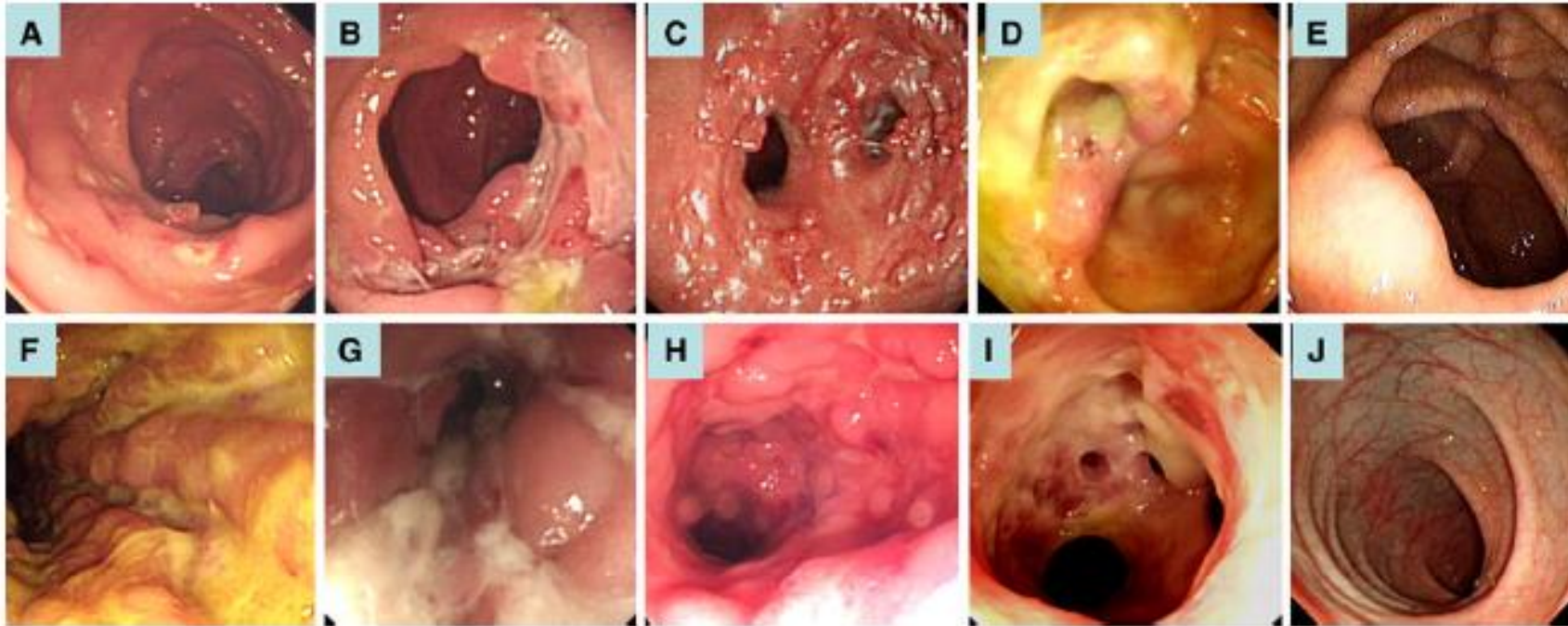


Crohn's  
disease

## Estimated TB incidence rates, 2020

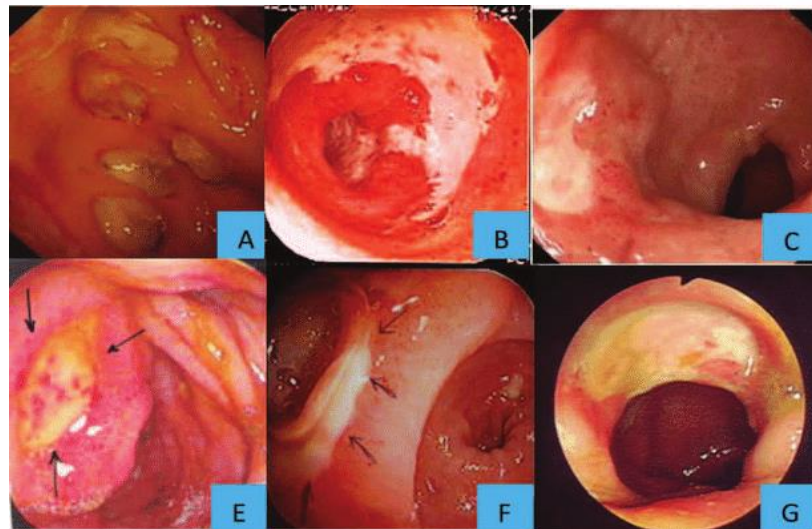


**TB**



**Crohn's**

**Behcet's**

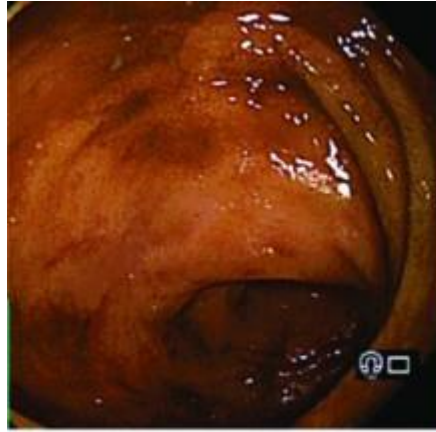


# TB vs Crohn's: Clinical & Endoscopic Features

**Table 5** Clinical and endoscopic features and models of CD and ITB (%)

Features	Sensitivity	Specificity	Accuracy	Positive PV	Negative PV
<b>Features for predictive diagnosis of CD</b>					
Hematochezia	32.1	92.9	56.8	86.9	48.4
Surgery history	32.7	89.4	56.1	81.8	47.6
Perianal disease	16.4	96.5	49.1	87.1	44.1
Rectum involved lesions	38.5	83.6	60.3	71.4	56.0
Longitudinal ulcers	54.7	91.7	71.4	87.5	65.5
Cobble-stone appearance	27.7	98.4	61.9	94.7	56.1
<b>Features for predictive diagnosis of ITB</b>					
Pulmonary tuberculosis	31.9	98.8	71.6	94.7	67.7
Ascites	35.4	92.7	69.4	76.9	67.2
PPD positive	42.7	93.0	70.6	83.0	66.9
Fixed-open ileocecal valve	50.8	87.7	69.8	79.5	65.5
Ring-like ulcers	41.7	95.4	69.0	89.3	63.3
Rodent-like ulcers	19.7	98.5	60.3	92.3	56.6

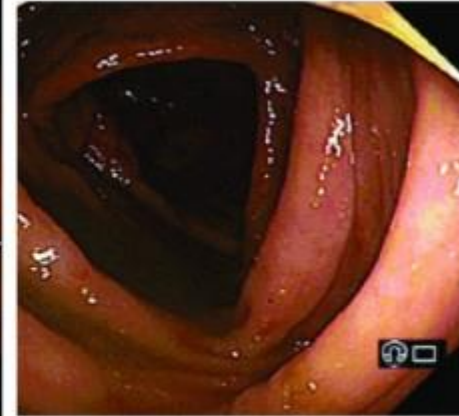
# Strongyloides infection



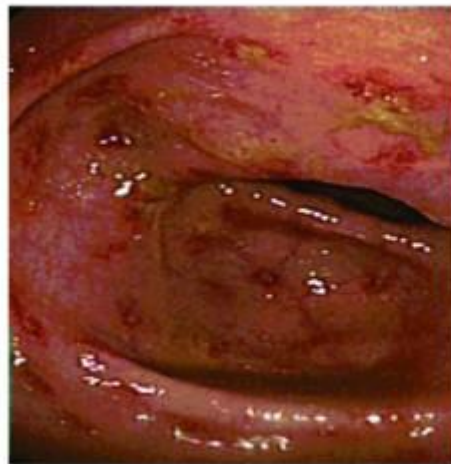
(A) Terminal ileum



(B) Caecum



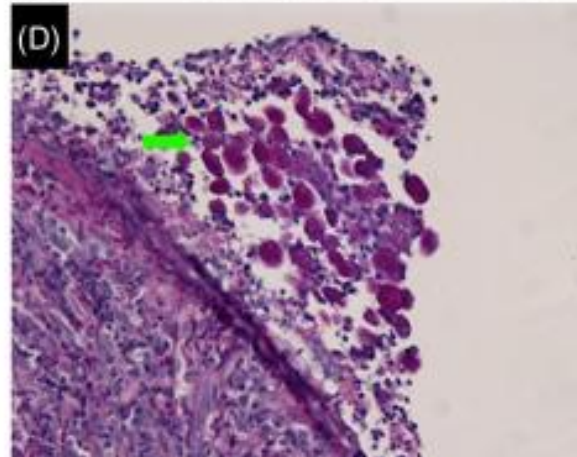
(C) Transverse colon



(D) Descending colon



# Amoebic colitis



# Schistosomiasis



- Isolated Small bowel lesions in 10-20% of CD



Capsule Endoscopy

Cost: 35000 egp !!



# Assessment of Disease activity

# Treatment targets in IBD

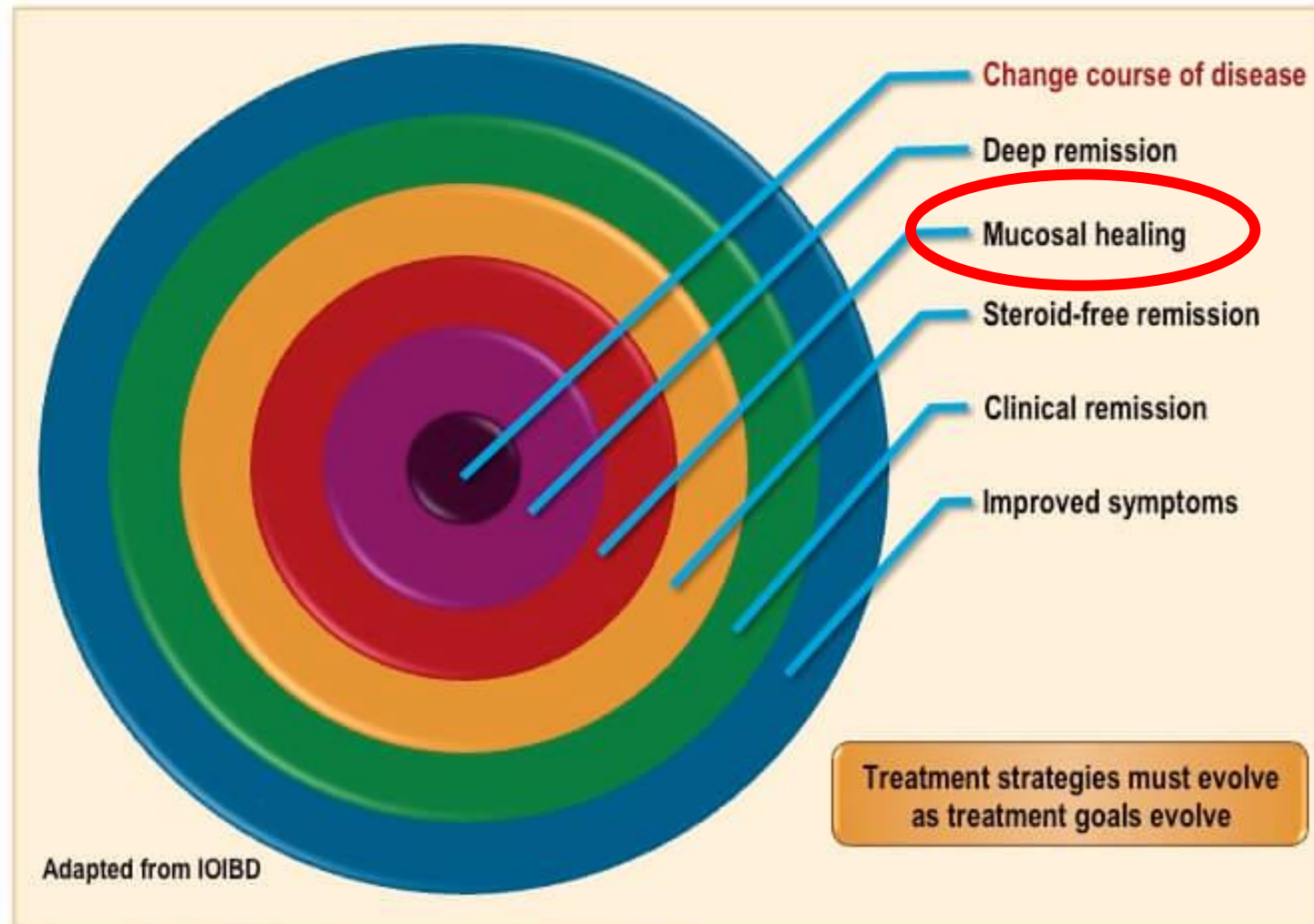
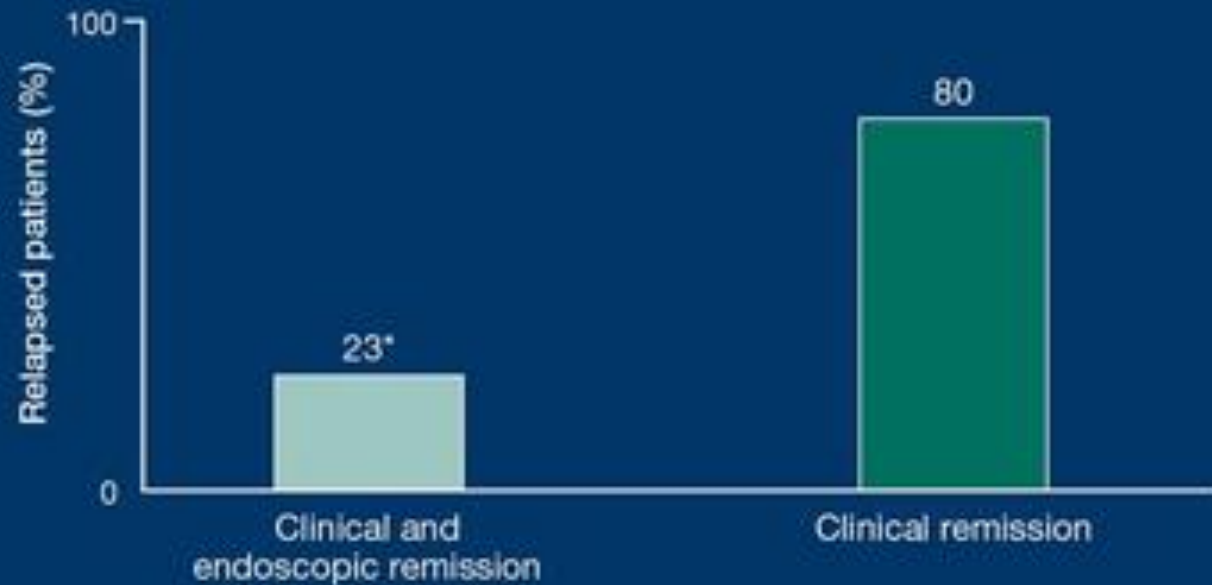


Figure 1. Evolution of treatment goals in IBD.

## Significantly Fewer Relapses in Patients Who Had Endoscopic Remission



\* $P < 0.0001$

Adapted from abstracts presented during the 2011 Advances in IBD Conference,  
December 1-3, 2011, Hollywood, Florida

## ENDOSCOPIC INDEX IN IBD



### Ulcerative Colitis

#### Partial Mayo score

**0=** Normal or inactive disease.  
**1=** Mild disease (erythema, decreased vascular pattern, mild friability)  
**2=** Moderate disease (marked erythema, absent vascular pattern, friability, erosions).  
**3=** Severe disease (spontaneous bleeding, ulceration).

#### UCEIS

Most severely affected area on endoscopy.  
**Vascular pattern:** 0: normal. 1: patchy obliteration 2: obliterated.  
**Bleeding:** 0= none 1: mucosal 2= luminal, mild 3= luminal, moderate or severe.  
**Erosions and ulcers:** 0: none 1: erosions 2: superficial ulcer 3: deep ulcer.

\* remission (0–1); mild (2–4); moderate (5–6); and severe ( $\geq 7$ )

### Crohn's disease.

#### SES CD

**Ulcers:** 0 = none, 1= aphtous ulcers (0.1-0.5 cm) 2= large ulcers (0.5-2cm) 3= very large ulcers (> 2 cm).  
**Ulcerated surface:** 0=none, 1= <10%, 2= 10-30% , 3= >30%.  
**Affected surface:** 0=none, 1= <50%, 2= 50-75%, 3= >75%.  
**Stenosis:** 0=none, 1= single, can be passed, 2= multiple, can be passed 3= can not be passed.

\*\*Inactive (0-2) Mild (3-6) Moderate (7-15) Severe >16.

#### Rutgeerts







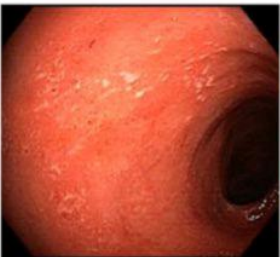




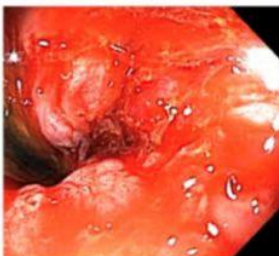
**i0:** absence of lesions.  
**i1:**  $\leq 5$  aphtous ulcers.  
**i2:** >5 aphtous ulcers with normal intervening mucosa, skip areas of larger lesions or lesions confined to ileocolonic anastomosis.  
**i3:** diffuse aphtous ileitis with diffusely inflamed mucosa.  
**i4:** diffuse inflammation with large.

\*\*\*  $\geq i2$ : defines endoscopic recurrence.

## ENDOSCOPIC OBJECTIVES

	CD	UC
ENDOSCOPIC REMISSION	SES- CD: 0-2 points After surgery a Rutgeerts score i0-i1	Mayo score 0* - 1 UCEIS 0
ENDOSCOPIC RESPONSE	Decrease > 50% in their SES- CD baseline scores	Decrease in Mayo score $\geq$ 1 pt Decreased in UCEIS $\geq$ 2 pts
SCOPING TIME Achieving deep remission	6-9 mo 6 mo post surgery	3-6 mo 6 mo post IPAA

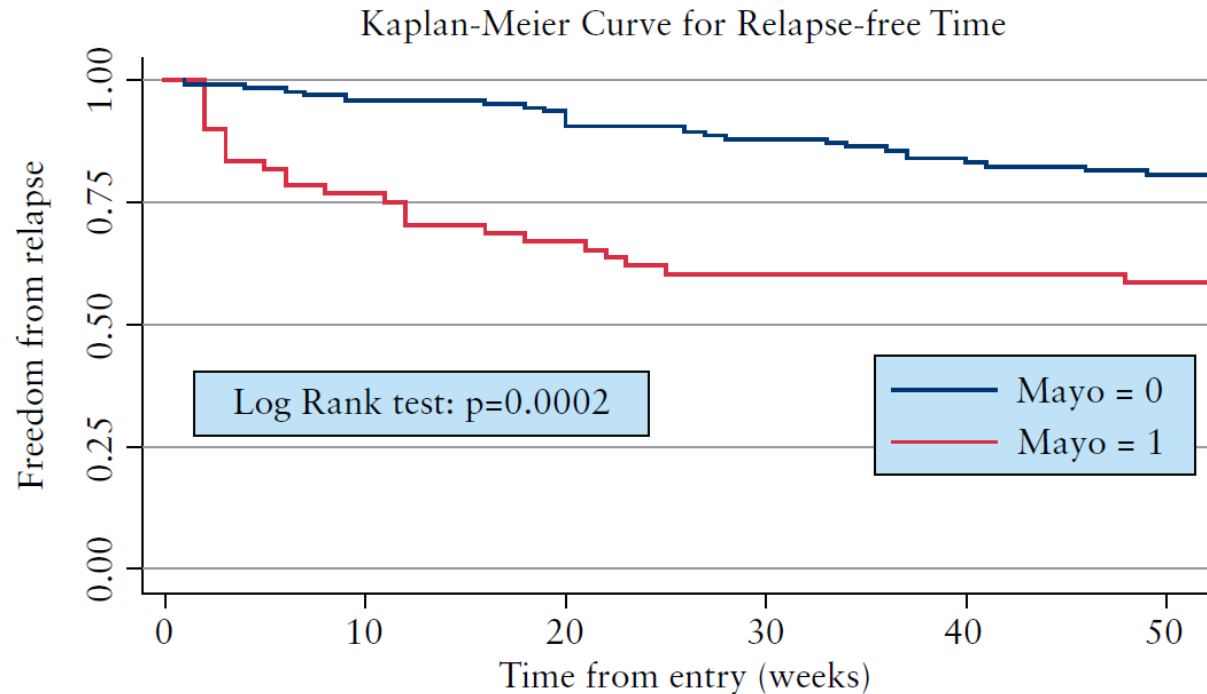


Endoscopic Assessment of Disease Activity			UCEIS Score	Mayo Score	Endoscopic Features
			0	0	Normal
			1-3	1	Erythema, decreased vascular pattern, mild friability
			4-6	2	Marked erythema, absent vascular pattern, friability, erosions
			7-8	3	Spontaneous bleeding, ulceration



## Evaluation of the Risk of Relapse in Ulcerative Colitis According to the Degree of Mucosal Healing (Mayo 0 vs 1): A Longitudinal Cohort Study

Manuel Barreiro-de Acosta, Nicolau Vallejo, Daniel de la Iglesia, Laura Uribarri, Iria Bastón, Rocío Ferreiro-Iglesias, Aurelio Lorenzo, J. Enrique Domínguez-Muñoz



- **Mayo 0: 9%**
- **Mayo 1: 36%**



# Screening for Dysplasia

## Risk of Colorectal Cancer in Patients With Ulcerative Colitis: A Meta-analysis of Population-Based Cohort Studies

TINE JESS,\* CHRISTINE RUNGOE,\* and LAURENT PEYRIN-BIROULET†

**Table 4.** Cumulative Incidence of CRC According to Duration of UC: Meta-Analysis of Population-Based Cohort Studies

Author, country	Follow-up (y)	CRC during follow-up (%)	Cumulative incidence of CRC (%)					
			5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
Stewenius et al, <sup>11</sup> Sweden	14	1.9	—	—	2	3	4	—
Winther et al, <sup>12</sup> Denmark	19	1.1	—	0.4	—	1.1	—	2.1
Palli et al, <sup>13</sup> Italy	11	1.5	—	—	—	—	—	—
Bernstein et al, <sup>14</sup> Canada	7	1.8	—	—	—	—	—	—
Wandall et al, <sup>15</sup> Denmark	10	0.7	—	—	—	5.3	10.1	—
Jess et al, <sup>16</sup> USA	13	1.6	0	—	0.4	—	2.0	—
Jess et al, <sup>17</sup> Denmark	10	1.1	—	—	—	—	—	—
Söderlund et al, <sup>18</sup> Sweden	24	3.3	—	—	—	2.5 <sup>a</sup>	3 <sup>a</sup>	—

- Cumulative CRC incidence:
  - <10 years: **<1%**
  - 15 years: **0.4-2%**
  - 20 years: **1.1-5.3%**



Cochrane Database of Systematic Reviews



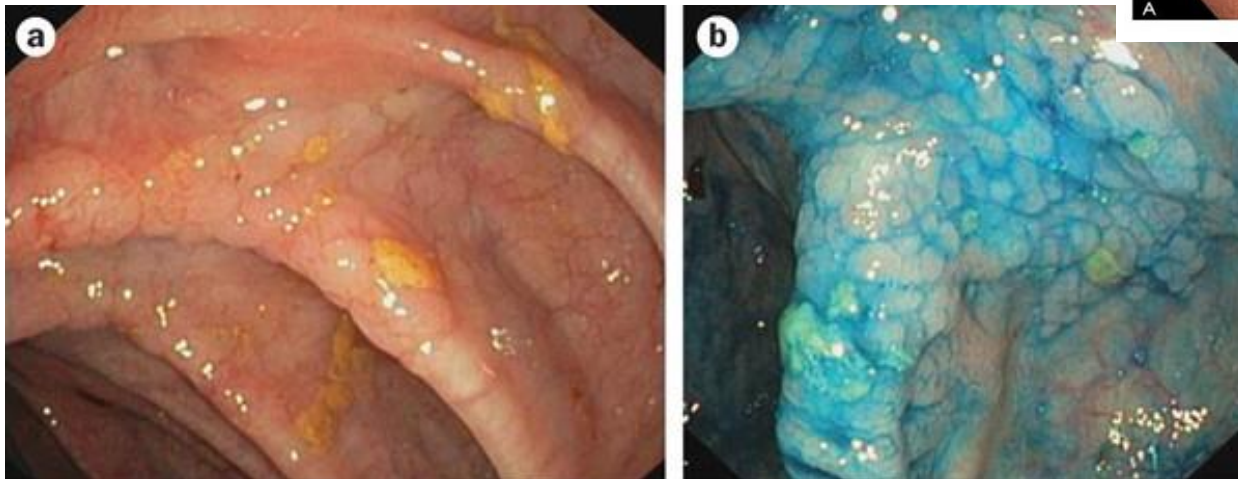
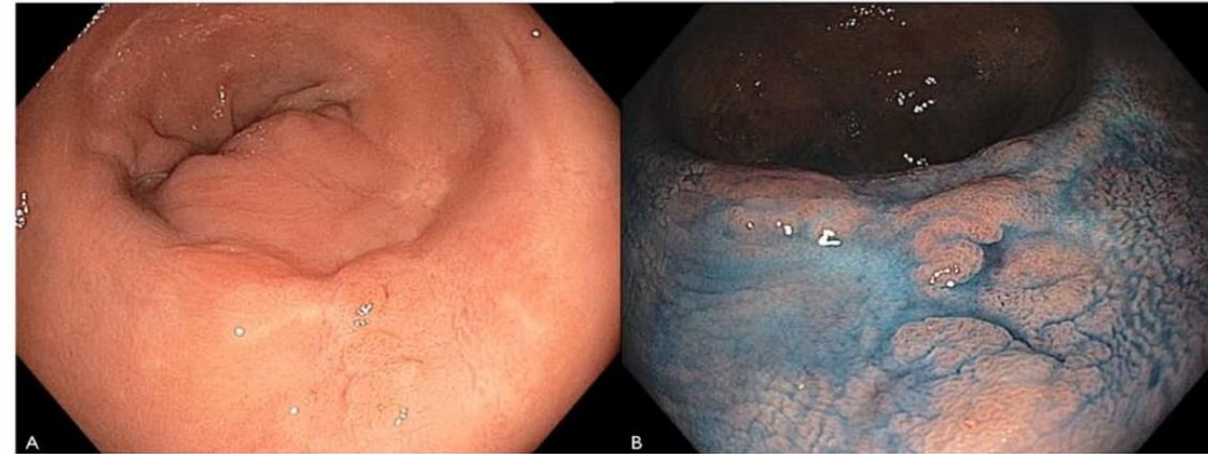
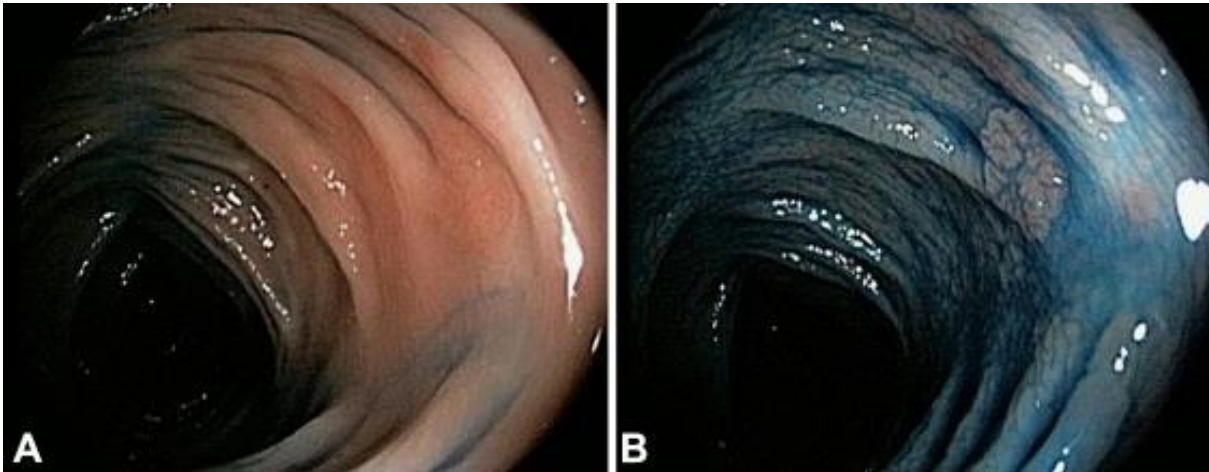
## Strategies for detecting colon cancer in patients with inflammatory bowel disease (Review)

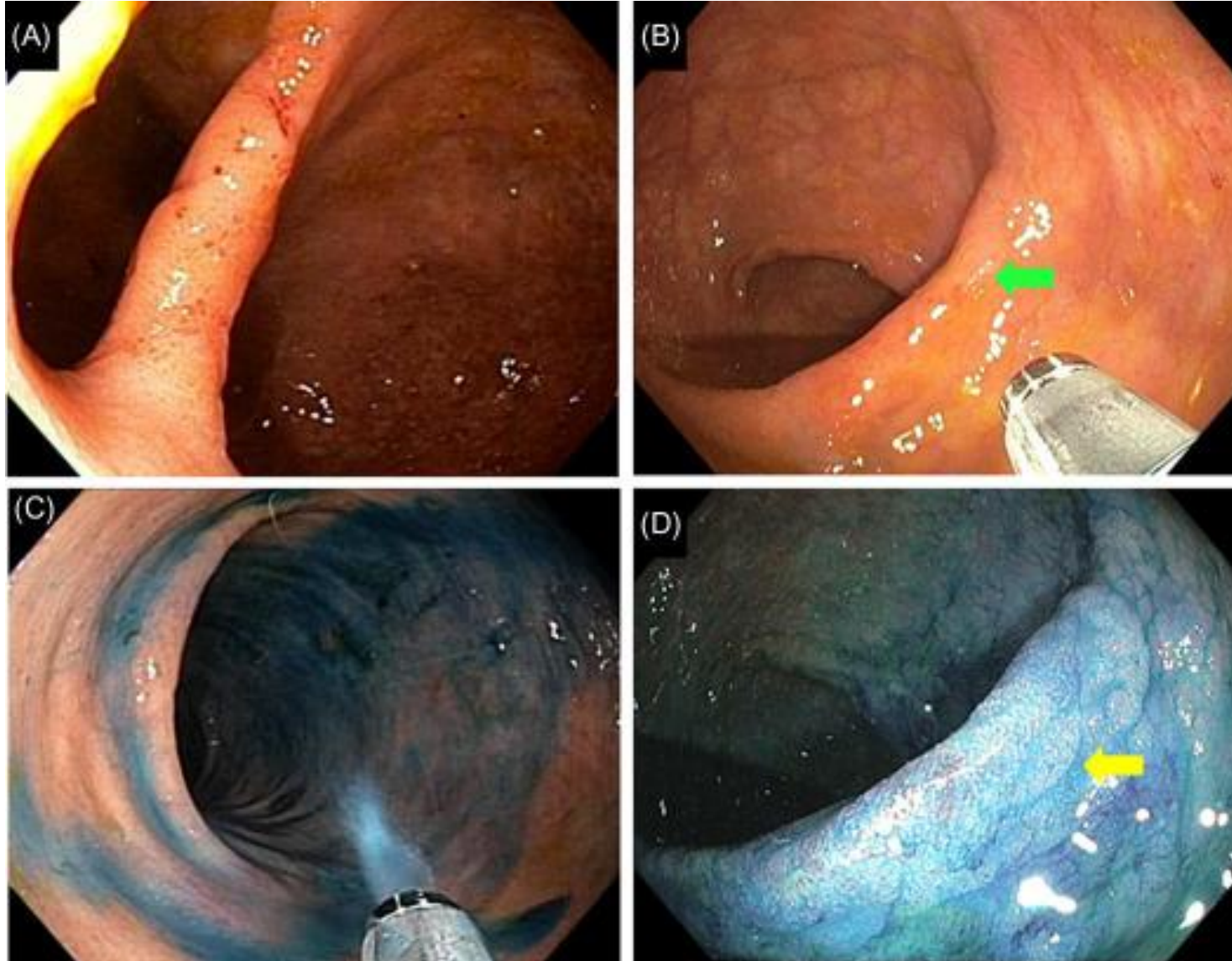
Bye WA, Nguyen TM, Parker CE, Jairath V, East JE

# Endoscopic surveillance vs No surveillance

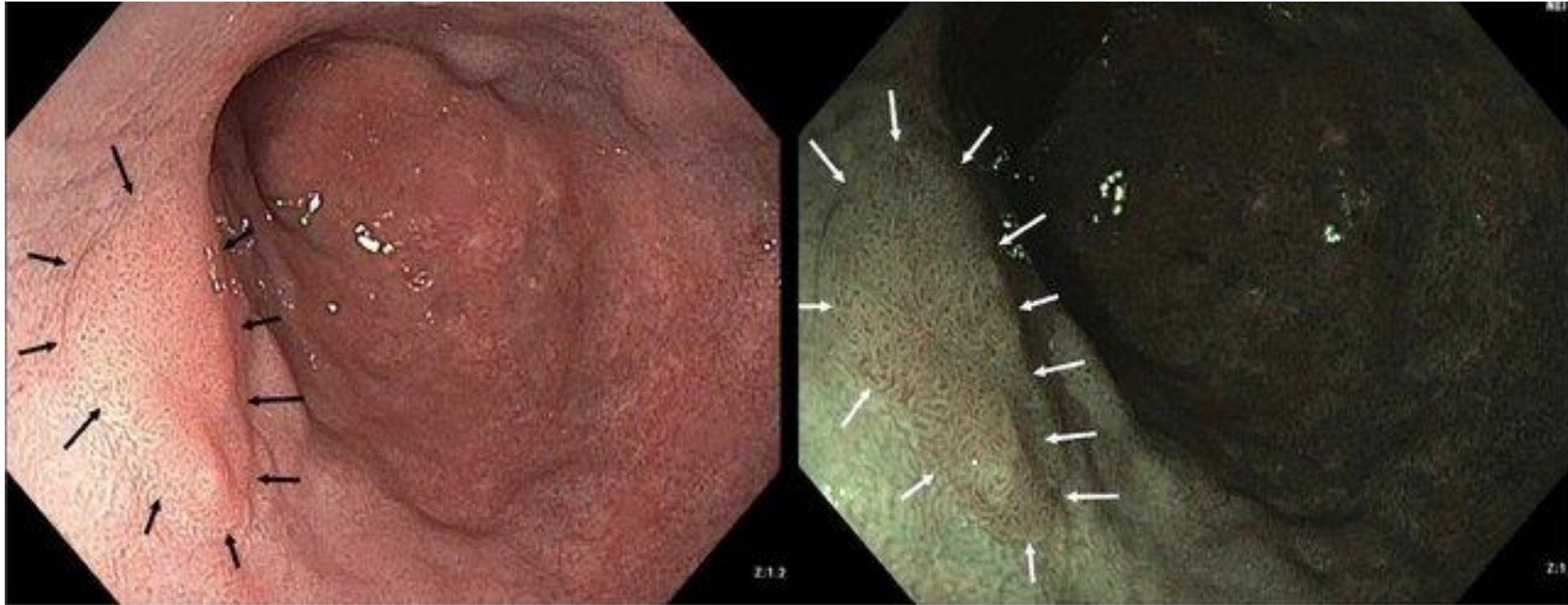
- Reduction in CRC incidence: **42%**
- Reduction in CRC related deaths: **64%**

# Chromoendoscopy





# Optically enhanced endoscopy (NBI)



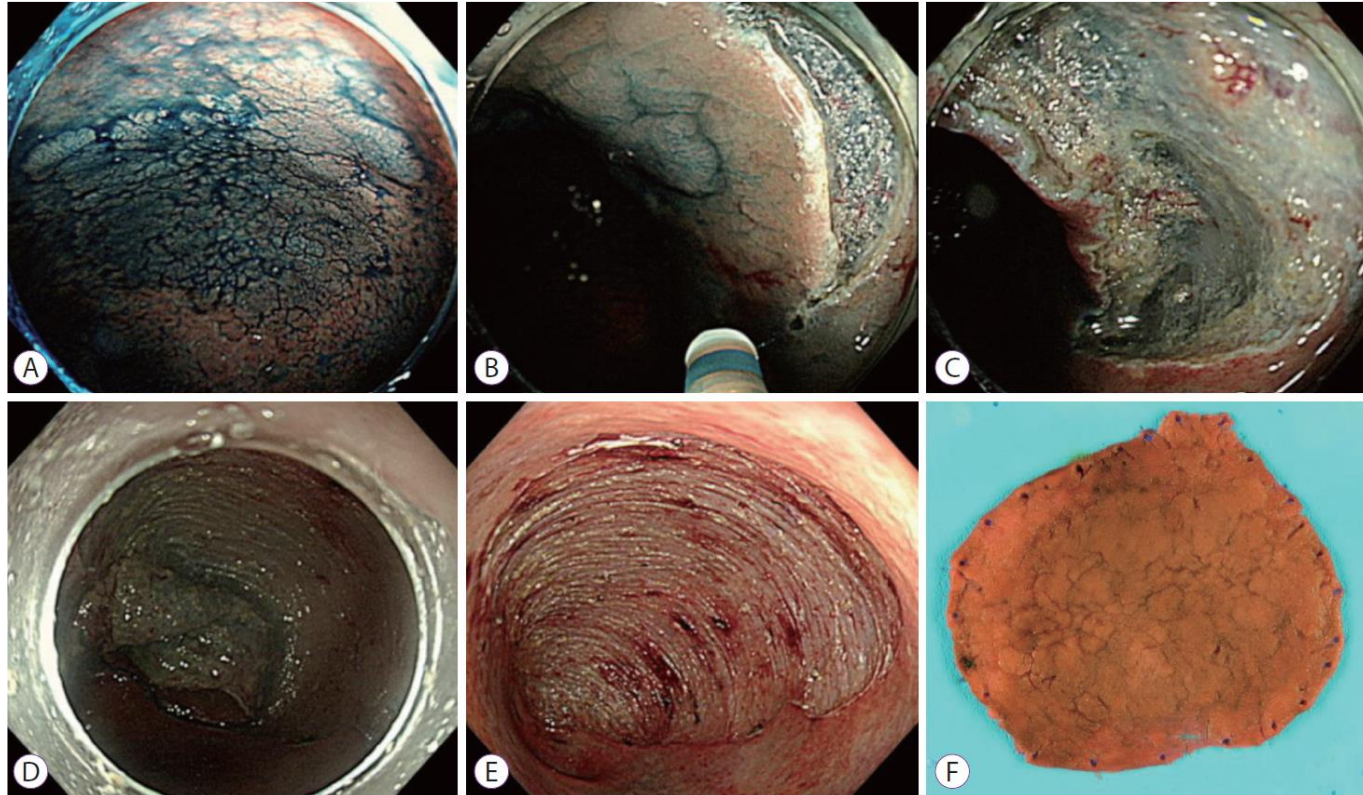




## Requirements for proper screening for dysplasia in UC

- Compliant educated patient!
- Multiple endoscopes to handle large case volume
- HD endoscopes + NBI Equipped endoscopes + Training
- Chromoendoscopy knowledge and training
- Dyes + spraying catheters
- Reaching mucosal healing before screening (biologics!!)
- Expertise in pathology interpretation
- Expert surgeons / therapeutic endoscopists

# ESD in UC



# ESD in UC

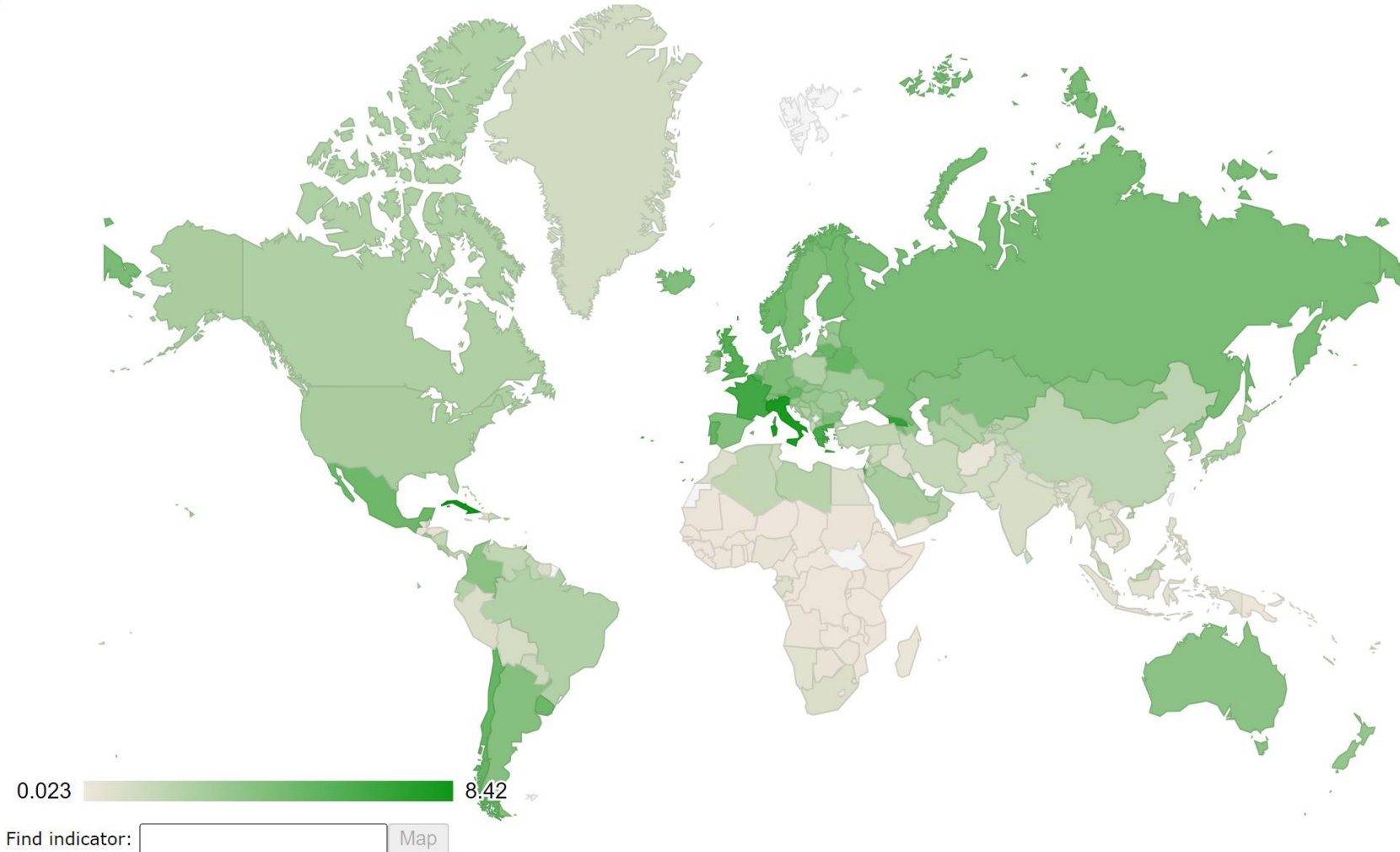
Study	Rate and reason of colectomy after ESD	Local recurrence	Metachronous recurrence	Follow-up, mo, median (range)
Iacopini et al. (2015) <sup>32</sup>	10% (1/10) T1 cancer with vascular invasion ( <i>n</i> =1)	22.2% (2/9)	37.5% (3/8)	24 (6–72)
Suzuki et al. (2017) <sup>40</sup>	12.5% (4/32) T1 cancer ( <i>n</i> =2) Invisible dysplasia ( <i>n</i> =1) Patient's preference for treating visible dysplasia ( <i>n</i> =1)	3.8% (1/26)	11.5% (3/26)	33 (6–76)
Kinoshita et al. (2018) <sup>27</sup>	20% (5/25) T1 cancer with non-curative resection ( <i>n</i> =5)	0	5% (1/20)	21 (8–80)
Yang et al. (2019) <sup>33</sup>	6.7% (1/15) Missed synchronous T1 cancer detected during ESD ( <i>n</i> =1)	14.3% (2/14)	14.3% (2/14)	24.7 (5.2–64.8)

ESD, endoscopic submucosal dissection.



# The Dark Reality

- Lack of medical personnel !



Medical staff Egypt: **0.7/ 1000**

Minimum required by WHO: 2.5/1000

## Gastrointestinal endoscopy capacity in Eastern Africa

OPEN  
ACCESS



Authors

Michael Mwachiro<sup>\*1</sup>, Hillary M. Topazian<sup>\*2</sup>, Violet Kayamba<sup>3</sup>, Gift Mulima<sup>4</sup>, Elly Ogutu<sup>5,6</sup>, Mengistu Erkie<sup>7</sup>, Gome Lenga<sup>8</sup>, Thomas Mutie<sup>6,9</sup>, Eva Mukhwana<sup>6</sup>, Hailemichael Desalegn<sup>10</sup>, Rezene Berhe<sup>11</sup>, Berhane Redae Meshesha<sup>12</sup>, Bongani Kaimila<sup>13</sup>, Paul Kelly<sup>3</sup>, David Fleischer<sup>14</sup>, Sanford M. Dawsey<sup>15</sup>, Mark D. Topazian<sup>16</sup>



► **Table 3** Human and health facility-related endoscopy resource

	Endoscopy capacity				
	Surveyed Eastern Africa countries			United States	The Netherlands
	n	per 100,000 people	adjusted <sup>1</sup> per 100,000 people	per 100,000 people	per 100,000 people
Endoscopists	64	0.03	0.12	1.20 <sup>3</sup>	2.51 <sup>4</sup>
Functioning gastroscopes	158.7	0.08	0.12	≥ 1.8 <sup>6</sup>	≥ 1.3 <sup>6</sup>
Functioning colonoscopes	112.1	0.05	0.09	≥ 3.3 <sup>6</sup>	≥ 1.5 <sup>6</sup>

## Gastrointestinal endoscopy capacity in Eastern Africa

OPEN ACCESS



### Authors

Michael Mwachiro<sup>\*1</sup>, Hillary M. Topazian<sup>\*2</sup>, Violet Kayamba<sup>3</sup>, Gift Mulima<sup>4</sup>, Elly Ogutu<sup>5,6</sup>, Mengistu Erkie<sup>7</sup>, Gome Lenga<sup>8</sup>, Thomas Mutie<sup>6,9</sup>, Eva Mukhwana<sup>6</sup>, Hailemichael Desalegn<sup>10</sup>, Rezene Berhe<sup>11</sup>, Berhane Redae Meshesha<sup>12</sup>, Bongani Kaimila<sup>13</sup>, Paul Kelly<sup>3</sup>, David Fleischer<sup>14</sup>, Sanford M. Dawsey<sup>15</sup>, Mark D. Topazian<sup>16</sup>



	Median	IQR
Functioning gastroscopes per facility	2	1–3
Functioning colonoscopes per facility	1	1–2
Maximum capacity for upper gastrointestinal procedures per week per facility	30	17.5–50
Maximum capacity for lower gastrointestinal procedures per week per facility	10	7.5–20
Patient cost for diagnostic endoscopy (USD)	100	53–150
Patient cost for therapeutic endoscopy (USD)	203	150–312

## Gastrointestinal endoscopy capacity in Eastern Africa

OPEN ACCESS



Authors

Michael Mwachiro<sup>\*1</sup>, Hillary M. Topazian<sup>\*2</sup>, Violet Kayamba<sup>3</sup>, Gift Mulima<sup>4</sup>, Elly Ogutu<sup>5,6</sup>, Mengistu Erkie<sup>7</sup>, Gome Lenga<sup>8</sup>, Thomas Mutie<sup>6,9</sup>, Eva Mukhwana<sup>6</sup>, Hailemichael Desalegn<sup>10</sup>, Rezene Berhe<sup>11</sup>, Berhane Redae Meshesha<sup>12</sup>, Bongani Kaimila<sup>13</sup>, Paul Kelly<sup>3</sup>, David Fleischer<sup>14</sup>, Sanford M. Dawsey<sup>15</sup>, Mark D. Topazian<sup>16</sup>



► **Table 5** How facilities obtain and

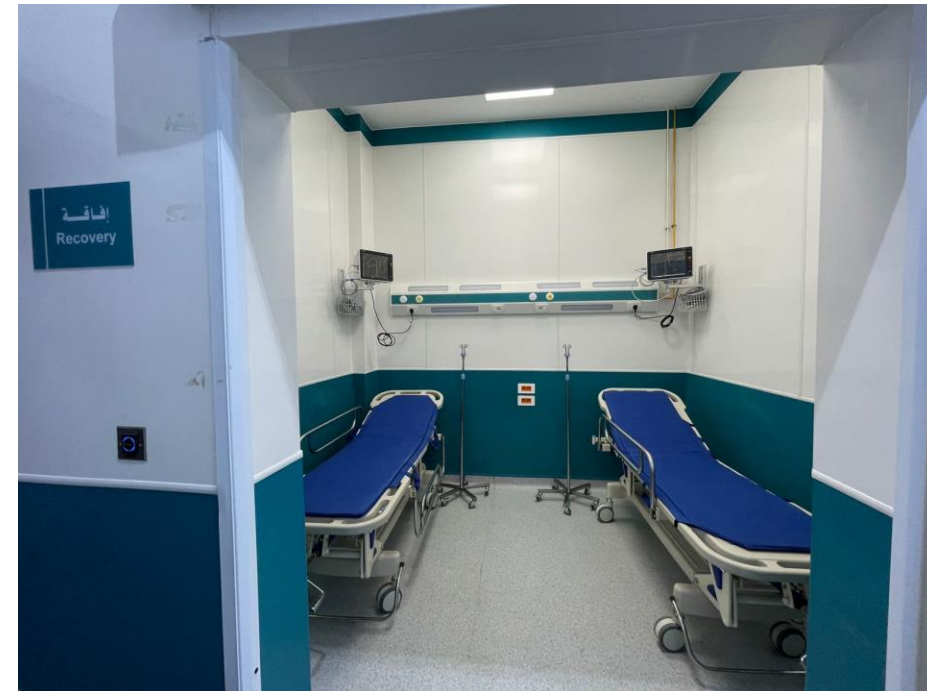
	%
How are endoscopes obtained?	–
▪ Donation (used and new)	45.5
▪ Purchase by facility (used and new)	63.6
▪ Purchase by government	13.0
▪ Research funding	15.6
How are endoscopes repaired?	–
▪ Unable to repair	21.9
▪ Self-repair	13.7
▪ Sent for repair in-country	43.8
▪ Sent elsewhere in Africa	21.9
▪ Sent elsewhere in the world	47.9
Who pays for endoscope repair?	–
▪ Donor	12.1
▪ Endoscopist	13.6
▪ Facility	68.2
▪ Government	9.1
▪ Research funds	18.2





# The GAP

- There is a huge gap between developed and developing.....widening!
- Funding
- Education
- Training
- **Centralized IBD centers may be the answer....!**
  - Avoid scatter of resources
  - Better education + Training
  - Centers become hub for education and training
  - Collect enough subjects for research

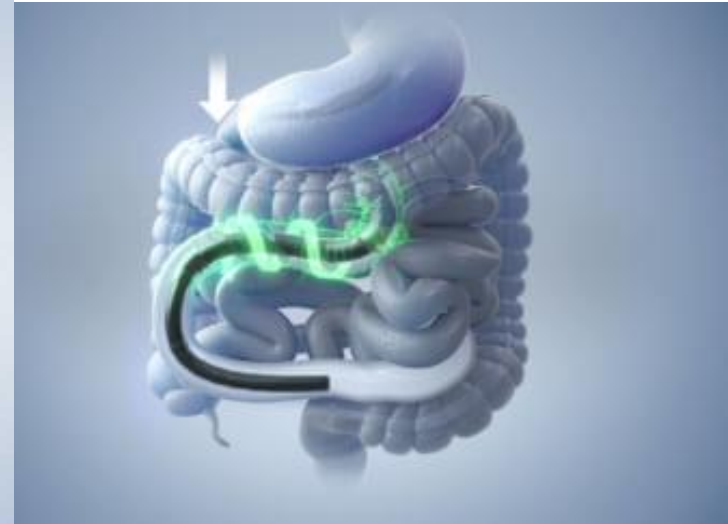


# Intestinal Endoscopy Unit



**OLYMPUS**

PowerSpiral  
Take Enteroscopy  
to the Next Level



# Intestinal Endoscopy Unit

Gastrointestinal Videoscope

GIF-1100

Slimmer Design with Outstanding Image Clarity



EVIS EXERA III VIDEOCOLONOSCOPE

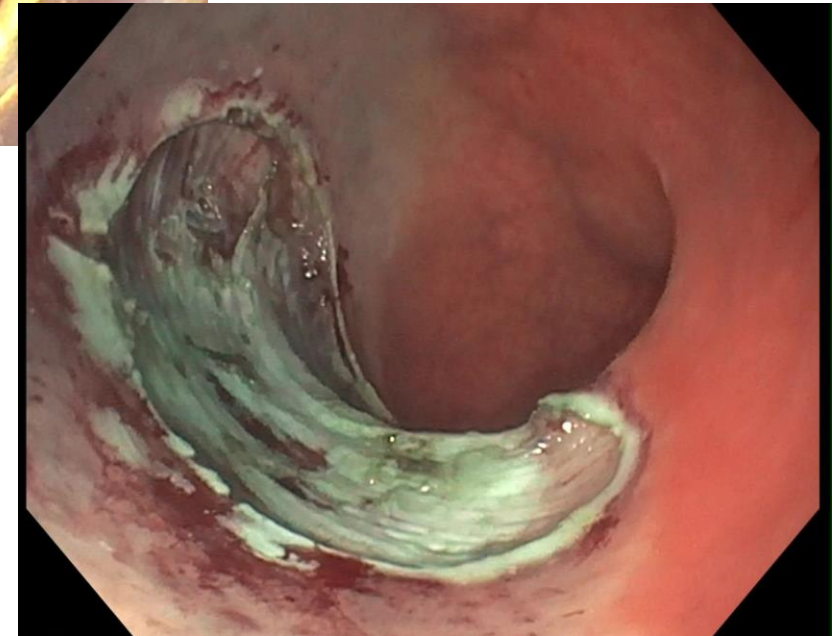
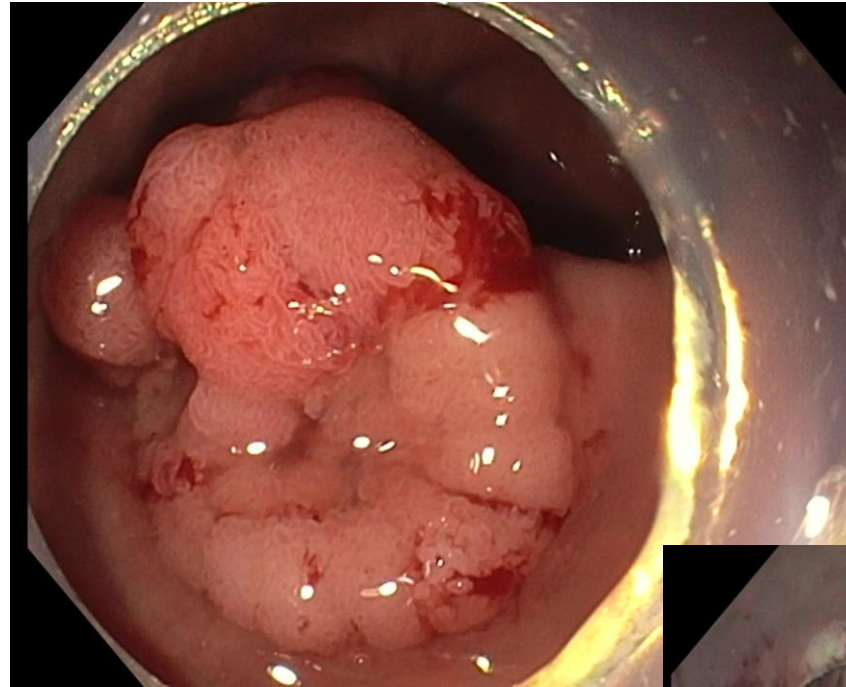
PCF-HQ190L/I

Outstanding Image Quality and Handling in a Slim Design



## X1 OLYMPUS VIDEO ENDOSCOPY SYSTEM

# Intestinal Endoscopy Unit



**ERBE VIO 3 + ERBEJET**



KASR ALAINY  
ENDEMIC MEDICINE  
DEPARTMENT

An endoscopic scoring system for ulcerative colitis

Score 0 - Normal or inactive disease

Score 1 - Mild disease (erythema, decreased vascular pattern, mild friability)

Score 2 - Moderate disease (marked erythema, absent vascular pattern, friability, erosions)

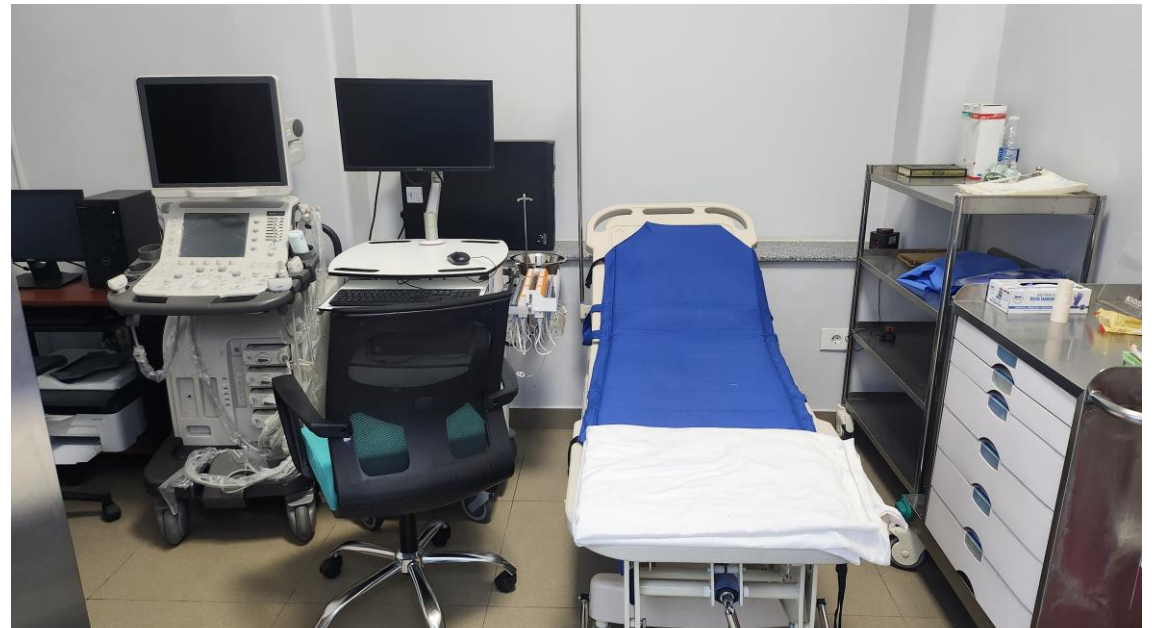
Score 3 - Severe disease (spontaneous bleeding, ulceration)

KASR ALAINY  
ENDEMIC MEDICINE  
DEPARTMENT

Table 2  
Simple endoscopic severity for Crohn's disease

Variable	0	1	2	3
Size of ulcers (cm)	None	Aphthous ulcers (0.1-0.5)	Large ulcers (0.5-2)	Very large ulcers (>2)
Ulcerated surface	None	<10%	10%-30%	>30%
Affected surface	Unaffected	<50%	50%-75%	>75%
Presence of narrowing	None	Single can be passed	Multiple can be passed	Cannot be passed

Score range: 0-56  
Severe disease: SES-CD ≥16  
Moderate disease: SES-CD = 7-15  
Mild disease: SES-CD = 3-6  
Inactive disease: SES-CD <2





European  
Crohn's and Colitis  
Organisation

INTEGRATED CLINICAL & RESEARCH  
CENTER FOR INTestinal DISORDERS

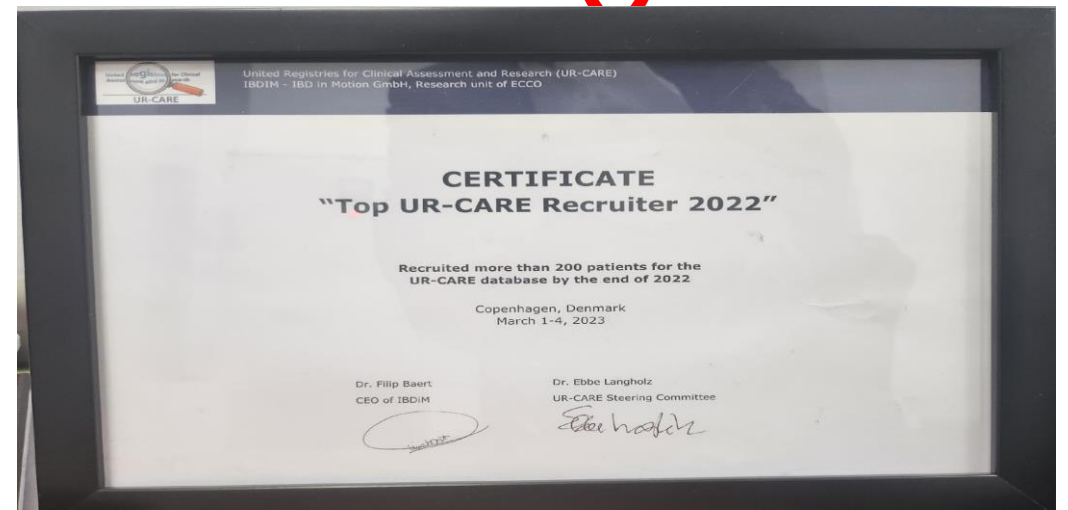
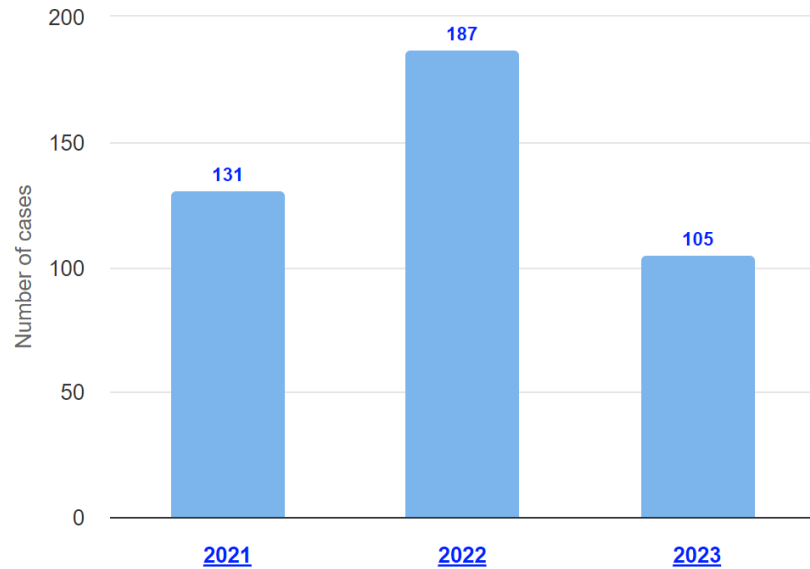


# Feb 2023

Patients included: 513 (of 14564)

## Yearly cases

Click the columns to see the monthly evolution detail per year







# Take Home Messages

- Endoscopy role in IBD rising
  - Diagnosis
  - Assessment of disease activity
  - Dysplasia screening and management
- Developing countries are struggling:
  - Financially
  - Education and training
  - Research
  - Low (but rising) number of cases
- Centralization: IBD centers of excellence could be the answer.....



Thank You !