

2023 SCSG LGI SYMPOSIUM



Bowel Preparation before Colonoscopy: Making it Clear!

Danny Issa, MD

Interventional Endoscopy

Assistant Professor of Medicine

Division of Digestive Diseases

David Geffen School of Medicine at UCLA

Office: (310) 267-3636

Cell: (773) 501-0737



- No conflict of interested related to this talk

Prep reviews!

Unbearable!!

disgusting

Awful!



Up all night!!

isn't so bad after all

Wasn't that hungry

Quick and easy

Prep reviews!

Safe, effective, and Tolerated



shutterstock.com - 2114224349

isn't so bad after all

Quick and easy

Wasn't that hungry

OBJECTIVES

The background of the slide features a scenic view of a city. In the upper portion, a hillside is densely packed with multi-story residential buildings. Below this, a city skyline with various skyscrapers is visible through a light haze. The lower half of the image is dominated by a lush, green forest with many trees, suggesting a park or a natural area within the city.

- Describe various methods for bowel preps
- Review comparative data on new prep types
- Outline contraindications to specific preps
- Review special & challenging situations

Good prep is Critical

Over 20 million colonoscopies are performed in US

Adequate prep leads to

- ✓ Shorter procedure time
- ✓ Higher ADR and cecal intubation rate
- ✓ Lower complication rates
- ✓ Less need for repeat exam – cost
- ✓ Advanced polypectomy, EMR, ESD, EFTR etc



Types of Colon Preps

Three categories of colon prep

1. Isosmotic
2. Hypoosmotic
3. Hyperosmotic

Types of Colon Preps

1. Isosmotic colon prep

- a) High-volume PEG preparations {balanced with nonfermentable electrolyte}
- b) Low-volume PEG preparations {same efficacy but in a more tolerable amount}
- c) Sulfate-free PEG-ELS {better smell & taste, less salty, more tolerable}

Types of Colon Preps

2. Hypoosmotic colon prep

- Low-volume PEG preparation called PEG-3350 (PEG-SD)
- Requires an additional electrolyte solution (sports drink)
- Often combined with bisacodyl

Types of Colon Preps

3. Hyperosmotic colon prep

- a) Magnesium citrate (not typically recommended)
- b) Oral sodium sulfate
- c) Sodium phosphate (no longer recommended - FDA warning)

General Contraindications

- Ileus
- Significant gastric retention
- Suspected or established bowel obstruction
- Severe inflammatory or infectious colitis
- Neurologic or cognitive impairment impairing swallowing








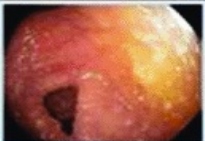


Special Contraindications

- Sodium phosphate-preps are avoided: serious electrolyte abnormalities and renal events
- Use PEG-ELS in heart failure, renal insufficiency (GFR <60), ESLD, or electrolyte imbalances (ex. Diuretics)
- Avoid hyperosmotic preparations in these patients



Boston Scale to assess prep quality

❖ The Boston Bowel Preparation Scale

BBPS		3	2	1	0
3=Excellent					
2=Good					
1=Poor					
0=Inadequate					
LC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BBPS= <input type="checkbox"/>					

Others

❖ Ottawa Bowel Preparation Scale

❖ Aronchik Scale

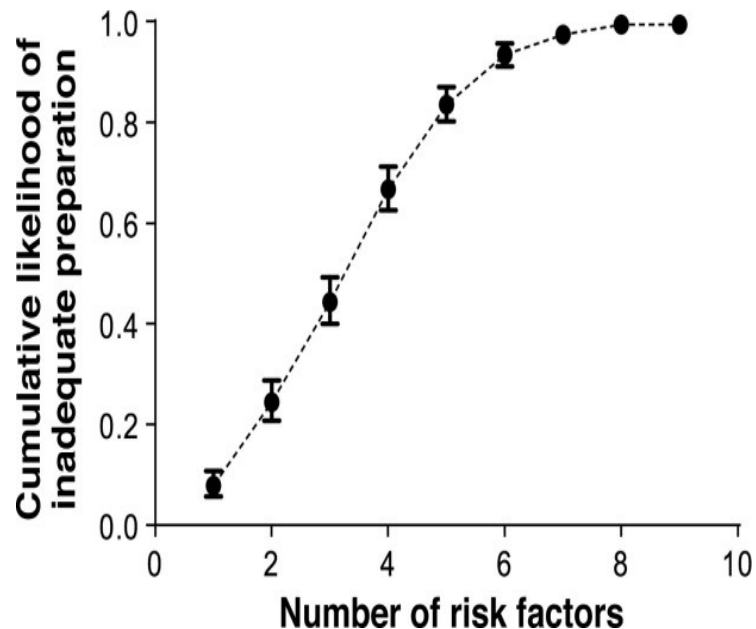
Higher scores indicate better preparation

Risk factors for poor pep

	Optimal preparation (n = 1163)	Suboptimal preparation (n = 241)	P value
Male gender [N (%)]	517 (44.5)	139 (57.7)	0.002
Age > 60 years [N (%)]	288 (24.8)	65 (30.0)	0.472
Age > 65 years [N (%)]	160 (13.8)	32 (13.3)	0.845
Overweight [N (%)]	626 (53.8)	148 (61.4)	0.032
Obesity [N (%)]	264 (22.7)	84 (34.9)	<0.0001
Constipation [N (%)]	265 (22.9)	70 (29.1)	0.039
Abdominal surgery [N (%)]	369 (31.7)	64 (26.6)	0.114
Diabetes [N (%)]	114 (9.8)	38 (15.8)	0.007
Cirrhosis [N (%)]	16 (1.4)	1 (0.4)	0.243
Stroke [N (%)]	13 (1.1)	3 (1.2)	0.866
Tricyclics use [N (%)]	16 (1.4)	1 (0.4)	0.243
<80 % consumption of PEG [N (%)]	17 (1.5)	17 (7.1)	<0.001

Risk factors for poor pep

Characteristics	Univariate unadjusted		Multivariate adjusted	
	Odds ratio	P value	Odds ratio	P value
Education level				
Illiterate	Ref	N/A	Ref	N/A
High school	1.15	0.46	1.09	0.68
College	1.13	0.56	1.01	0.96
Grad school	1.95	0.03	1.93	0.04
Ethnicity				
African American	Ref	N/A	Ref	N/A
Caucasian	0.7	0.12	0.75	0.2
Asian	0.49	0.12	0.42	0.06
Hispanic	0.47	<0.01	0.47	<0.01
Other ethnicity	0.09	0.02	0.01	0.02
Dementia	0.44	0.18		
Cancer	1.28	0.16		
Constipation	1.44	0.02	1.29	0.13
Iron supplement	1.49	0.02	1.26	0.19
Hemoglobin <10	1.64	<0.01	1.41	0.05
Indication for colonoscopy				
Bleeding/iron deficiency anemia	Ref	N/A	Ref	N/A



Comparison between Preps

ARTICLE: ENDOSCOPY

A Safety and Efficacy Comparison of a New Sulfate-Based Tablet Bowel Preparation Versus a PEG and Ascorbate Comparator in Adult Subjects Undergoing Colonoscopy

Di Palma, Jack A. MD, MACG¹; Bhandari, Raj MD²; Cleveland, Mark vB. PhD³; Mishkin, Daniel S. MD⁴; Tesoriero, Jessica BS³; Hall, Sue PhD³; McGowan, John MPH³

Table 2. Overall cleansing ratings

	OST (n = 278)	PEG-EA (n = 270)	95% CI ^b	P value ^{c,d}	P value ^e
Success (n %) ^a	257 (92.4)	241 (89.3)	-1.6 to 8.0	0.217	<0.001
Failure (n %)	21 (7.6)	29 (10.7)			
Grade (n %)					
Excellent	184 (66.2)	154 (57.0)		0.034	
Good	73 (26.3)	87 (32.2)			
Fair	11 (4.0)	15 (5.6)			
Poor	8 (2.9)	11 (4.1)			
Missing ^f	2 (0.7)	3 (1.1)			

Comparison between Preps

Preference questionnaire
Oral sulfate tabs
Vs. PEG-EA

	OST (n = 278) (n %)	PEG-EA (n = 270) (n %)	Pvalue ^b
Experience consuming prep			
Very easy	73 (26.3)	39 (14.7)	<0.001
Easy	108 (38.8)	66 (24.8)	
Tolerable	73 (26.3)	106 (39.8)	
Difficult	16 (5.8)	36 (13.5)	
Very difficult	8 (2.9)	19 (7.1)	
Very easy + easy	181 (65.1)	105 (39.5)	<0.001
Overall experience			
Excellent	66 (23.7)	38 (14.3)	0.007
Good	133 (47.8)	121 (45.5)	
Fair	58 (20.9)	83 (31.2)	
Poor	11 (4.0)	16 (6.0)	
Bad	10 (3.6)	8 (3.0)	
Excellent + Good	199 (71.6)	159 (59.8)	0.004
Comparison with previous experience (n %)			
Better	121 (65.1)	84 (45.9)	<0.001
Same	37 (19.9)	77 (42.1)	
Worse	28 (15.1)	22 (12.0)	

Comparison between Preps

ORIGINAL CONTRIBUTIONS: ENDOSCOPY

Comparative Evaluation of the Efficacy of Polyethylene Glycol With Ascorbic Acid and an Oral Sulfate Solution in a Split Method for Bowel Preparation: A Randomized, Multicenter Phase III Clinical Trial

Kim, Bun M.D.¹; Lee, Seong Dae M.D.²; Han, Kyung Su M.D.¹; Kim, Byung Chang M.D.¹; Youk, Eui-Gon M.D.²; Nam, Myung Jin M.D.¹; Lee, Doo Han M.D.²; Sohn, Dae Kyung M.D., Ph.D.¹

- prospective, multicenter, randomized controlled clinical trial
- 84 subjects in PEG and 83 subjects in oral sulfate solution group
- ✓ Success was not different (91% vs 96% $p = 0.20$)
- ✓ Rate of adverse GI events was not different
- ✓ mean intensity of vomiting was higher in the oral sulfate solution (1.6 vs 1.9 $p = 0.02$)



Comparison between Preps

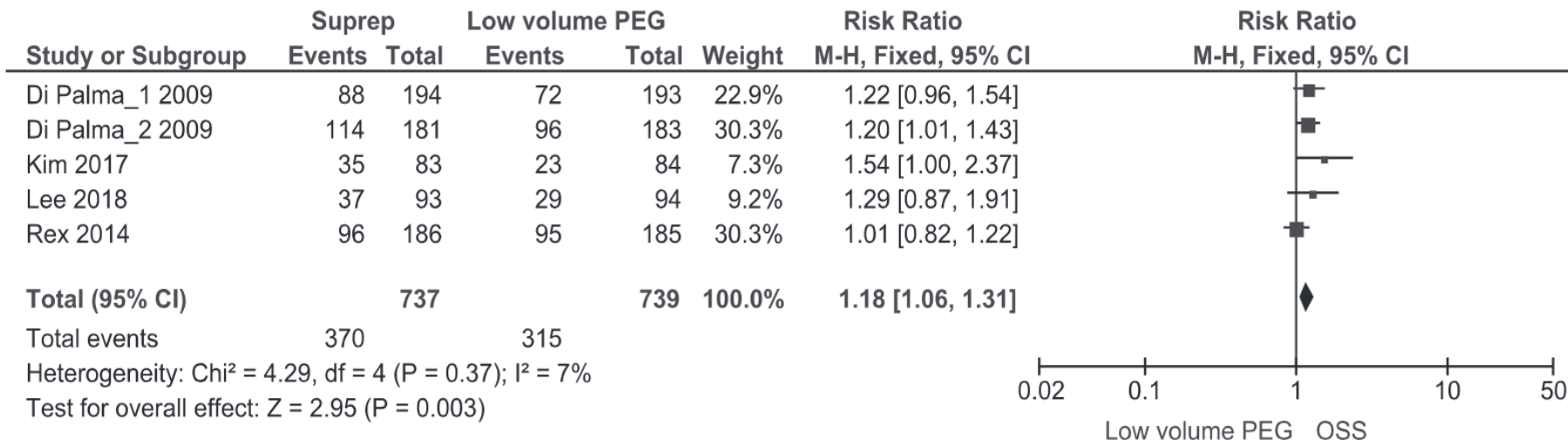
Digestive Endoscopy 2022; 34: 721–728

doi: 10.1111/den.14194

Review

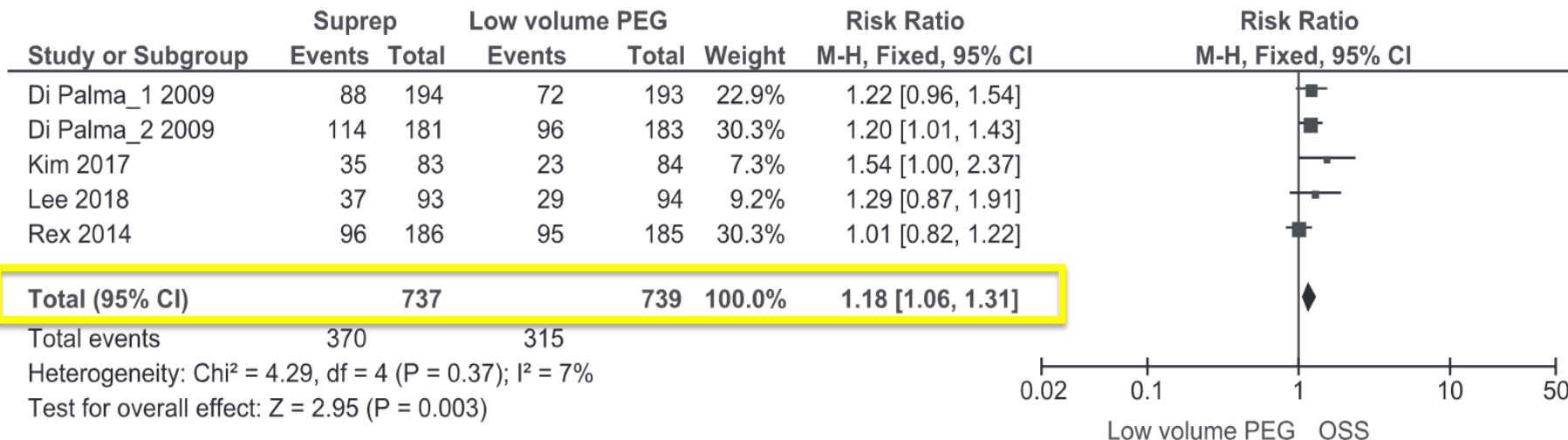
Oral sulfate solution versus low-volume polyethylene glycol for bowel preparation: Meta-analysis of randomized controlled trials

Ijlal Akbar Ali,^{1,3}  Daniel Roton² and Mohammed Madhour^{1,3} 



Comparison Oral sulfate vs low volume PEG

Conclusion: Individuals at low risk of inadequate prep are more likely to achieve excellent prep with OSS, but experience more nausea and vomiting than PEG





How to Improve Prep Efficacy?

Making prep work better

Split Prep: Works better

giving part (usually half) of prep on the same day as the colonoscopy

Second dose: between 3 - 8 hours before colonoscopy

- increase ADR
- improves tolerance
- increased willingness to repeat procedure
- improved quality for both morning and afternoon procedures



Making prep work better

Instructions & Education

- Important patients are educated and engaged in prep process
- Patient counseling along with written
- Use native language if possible
- Visual Aid: simple and easy



Making prep work better

Low residue diet vs clear liquids:

- May be non-inferior to CLD
- Higher satisfaction & adherence

Retrospective study (n=660, Manhattan VA): similar rate with LRD
85% found the process easy or acceptable,
and 78% reported full adherence to LRD

Meta-analysis: Nine studies (1686 patients)

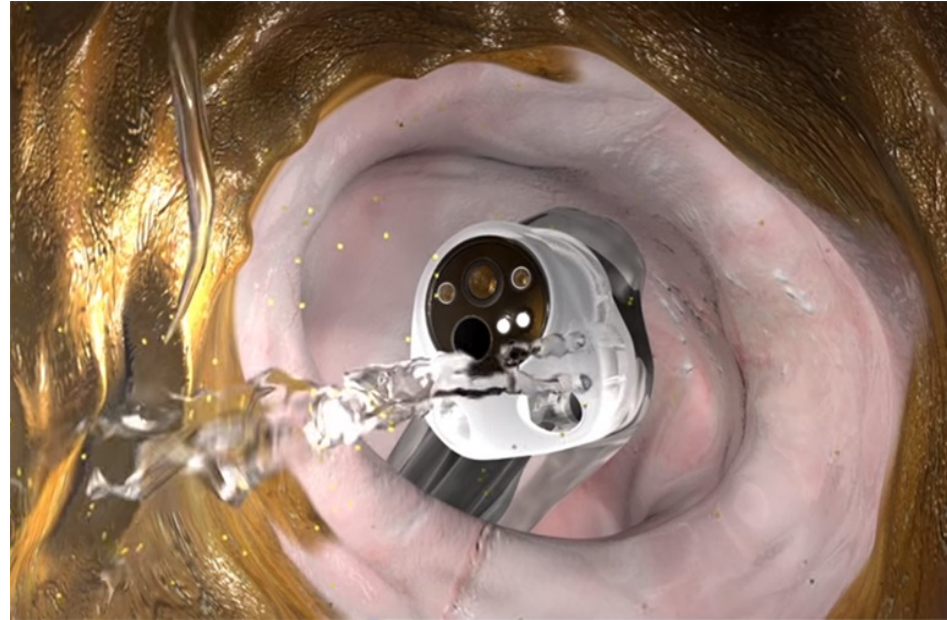
Improved tolerability by patients and willingness to repeat preparation with no differences in preparation quality and adverse effects

Making prep work better - Adjunct tools

Irrigation sleeve

- 4 sprinklers plus a suction channel
- Allows “aggressive” irrigation and cleansing
- FDA-cleared system available
 - Compatible with most colonoscopes

Multicenter study of 94 patients showed **improvement in BBPS in all segments, and very high adequate prep rates**



Making prep work better - Adjunct tools

①



Oversleeve

②



Foot Pedal

③



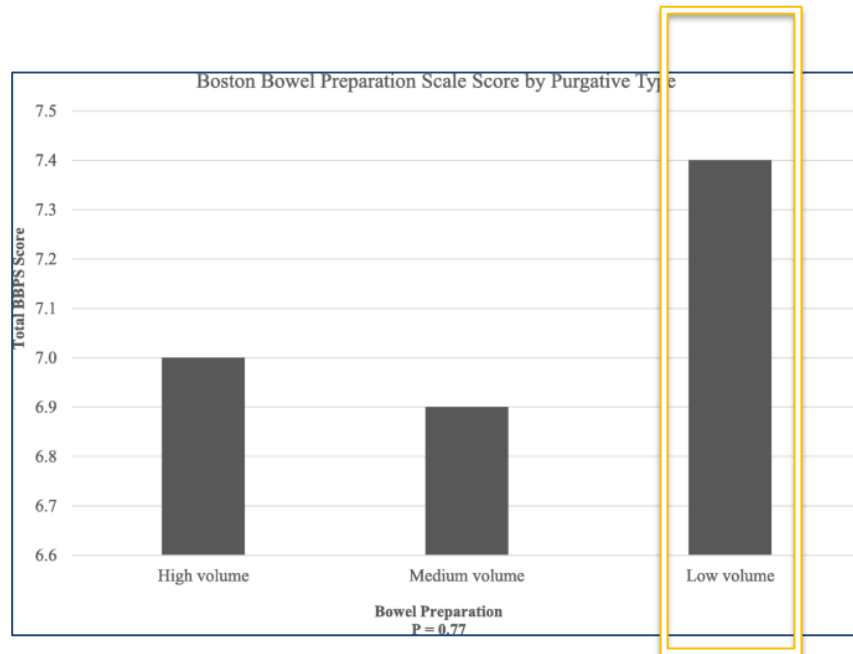
Multicenter study of 94 patients showed **improvement in BBPS in all segments, and very high adequate prep rates**



Challenging Scenarios

Inpatient colonoscopy

- Prospective, single blinded randomized controlled trial
- Hospitalized patients undergoing inpatient
- Assigned randomly to receive a high, medium, or low-volume prep



Inpatient colonoscopy

	Large volume	Medium volume	Low volume	P-value
Unpleasant taste				
Mean (SD)	2.2 (± 0.97)	2.1 (± 1.36)	0.6 (± 0.74)	≤ 0.01
Range	1-3	0-4	0-2	
Nausea				
Mean (SD)	0.9 (± 1.27)	0.5 (± 1.07)	0 (0.0)	0.19
Range	0-3	0-3	0	
Vomiting				
Mean (SD)	0.1 (± 0.33)	0 (0.0)	0 (0.0)	0.43
Range	0-1	0	0	

Obesity and colon prep



Original articles—alimentary tract

Impact of Obesity on Bowel Preparation for Colonoscopy

Brian B. Borg, Nitin K. Gupta, Gary R. Zuckerman, Bhaskar Banerjee, C. Prakash Gyawali [Q](#) [✉](#)

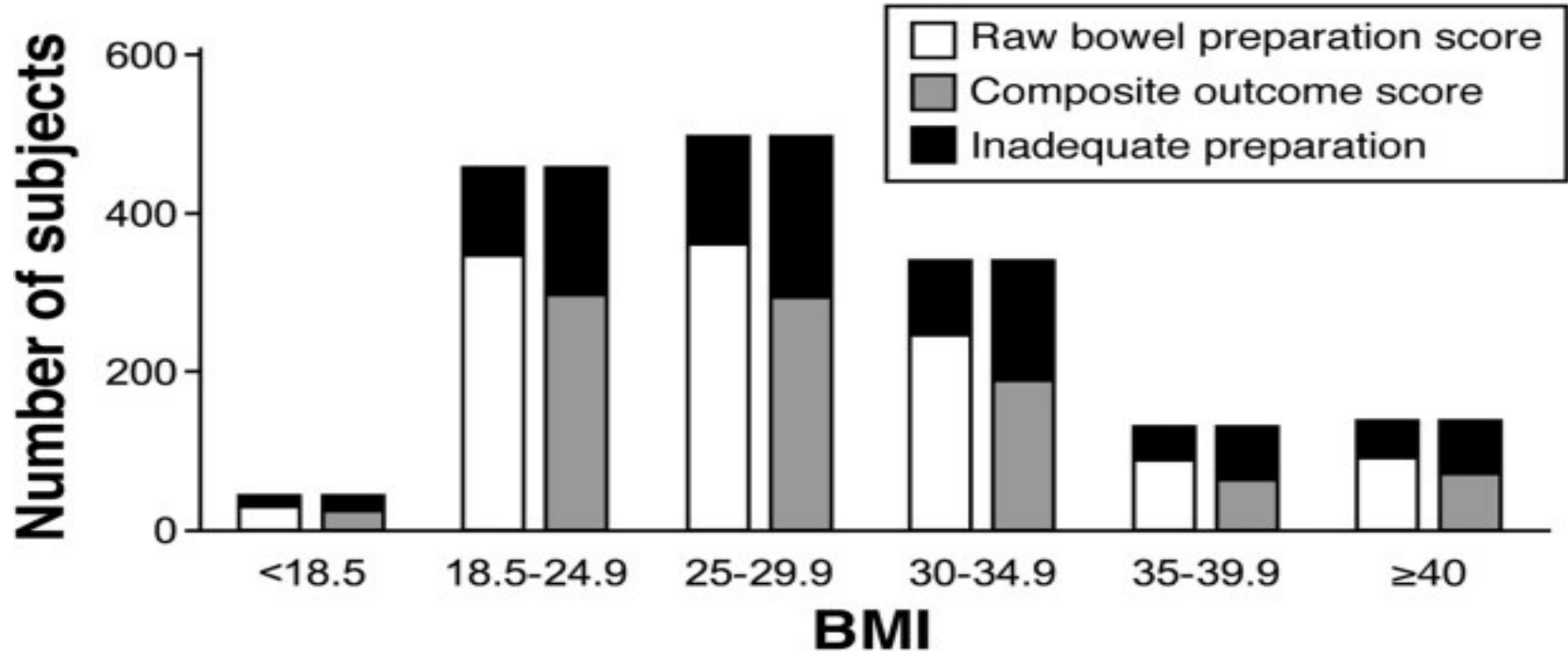
Variables	Odds ratio	95% Confidence interval	P value
BMI ≥ 25	1.28	1.01–1.61	.04
Male gender	1.36	1.10–1.61	.004
Inpatient status	1.54	1.11–2.13	.009
Smoking status	1.31	1.03–1.67	.03
Alcohol consumption	0.76	0.61–0.95	.01
Antidepressant use	1.67	1.22–2.29	.002
Narcotic use	2.06	1.30–3.25	.001
Diabetes mellitus	1.37	1.05–1.78	.02
Decreased mental capacity	2.17	1.06–4.45	.03

1588 patients

**Both BMI >25 (P 0.04)
and >30 (P 0.006)**

**Obesity is an independent
predictor of inadequate
bowel preparation**

Obesity and colon prep



Elderly and colon prep

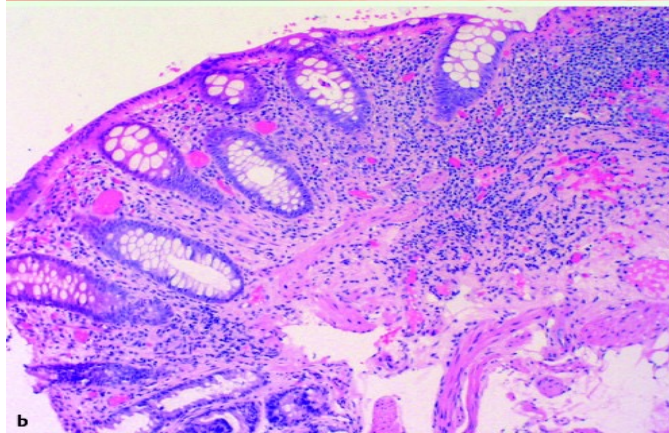
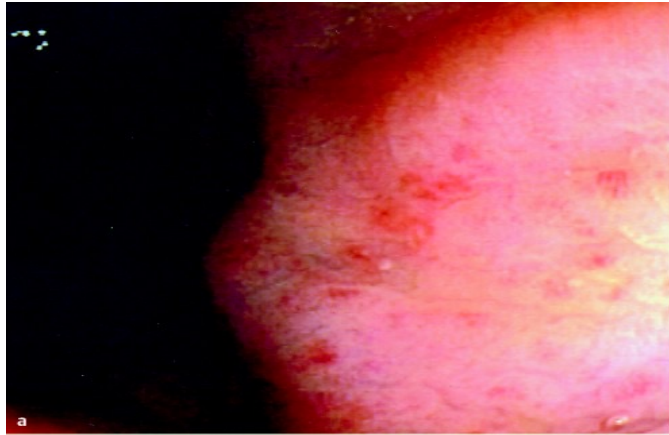
- ✓ Use a PEG-ELS in older adults (>65 years of age)
- ✓ Use in Heart failure, Renal insufficiency
- ✓ PEG (high and low vol) Ok for patients on diuretics
- ✓ Avoid Hyperosmotic laxative regimens may lead to volume and electrolyte shifts, and many of these preparations are renally excreted

Pregnant patients

- Studies lacking
- Tap water enemas or PEG-ELS preparations are safe
- Avoid hyperosmotic solutions

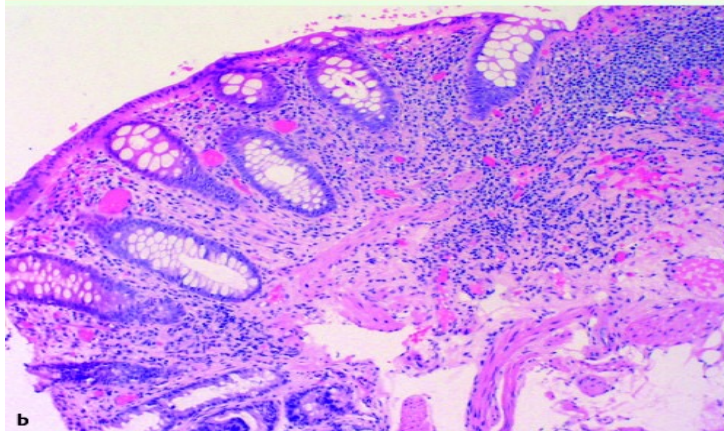


Patients with IBD



- Prospective RCT evaluated prep-induced mucosal inflammation of sodium phosphate vs PEG
- 634 patients
- Mucosal inflammation/ulceration occurred in 0.35% (1/284) of patients taking PEG
- compared with 3.4% (6/179) receiving NaP ($P = 0.03$)

Patients with IBD



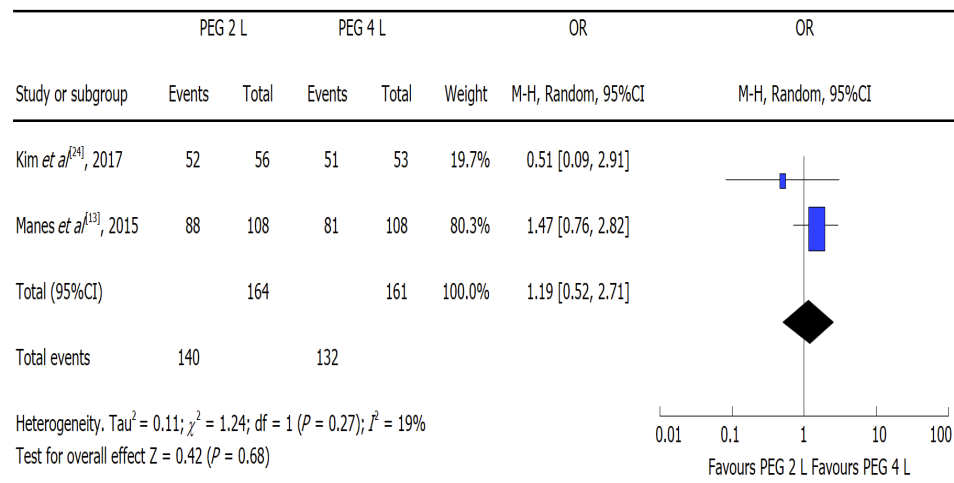
- ✓ Prefer PEG-ELS preparations in patients with IBD
- ✓ Hyperosmotic preparations may lead to diagnostic confusion

Patients with IBD

Systematic review and meta-analysis of colon cleansing preparations in patients with inflammatory bowel disease

Sophie Restellini, Omar Kherad, Talat Bessissow, Charles Ménard, Myriam Martel, Maryam Taheri Tanjani,

- Systematic review of 4 trials
- 449 patients
- PEG high-volume vs PEG low-volume
- In IBD patients



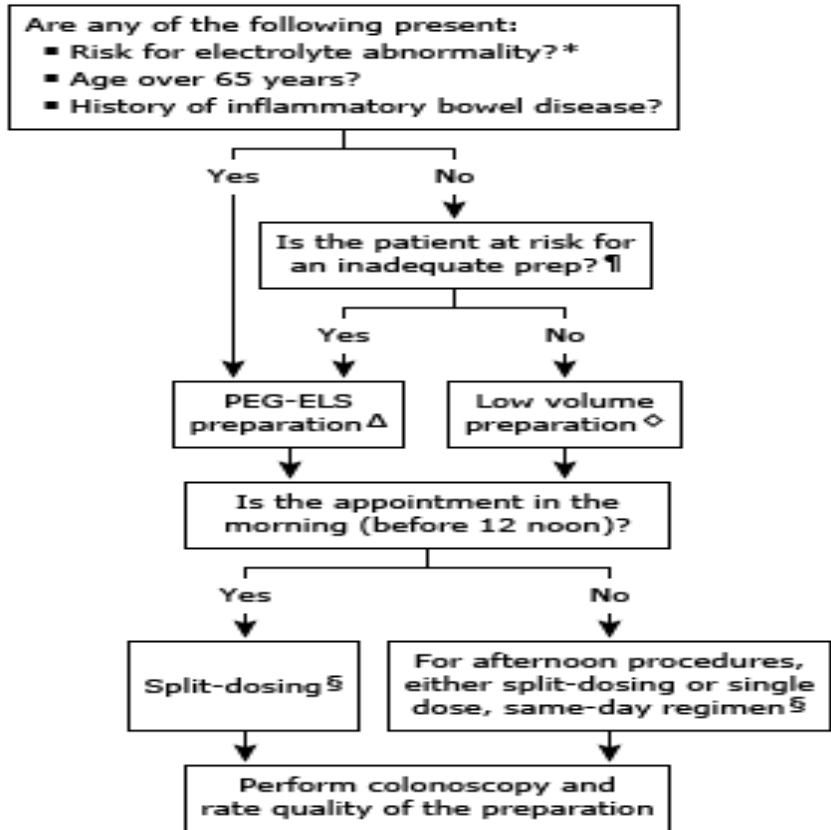
Colonoscopy in VA

- VA unique population
- Increased risk for poor prep
- Delayed inpatient endoscopy
- 653 colonoscopies performed at the Veterans Affairs

Multivariate Predictors of Adequate Bowel Prep

Predictors	Odds Ratio	95% CI	p
Left Colon			
No Narcotic Med	1.93	(1.21, 3.07)	0.006
“Split” PEG Prep	2.46	(1.55, 3.92)	0.001
Right Colon			
No Narcotic Med	1.71	(1.08, 2.71)	0.023
Not Diabetic	1.64	(1.08, 2.50)	0.020
“Split” PEG Prep	2.79	(1.82, 4.28)	0.001
Overall Colon			
No Narcotic Med	2.08	(1.32, 3.28)	0.001
“Split” PEG Prep	2.87	(1.88, 4.40)	0.002

What Prep to Use?



- ✓ Safe
- ✓ Effective
- ✓ Tolerated

Conclusions

- PEG Solutions are effective and safe
- Oral Sulfate solutions & tablets: new and tolerated option
- Avoid hyperosmolar preps in older and sick patients
- Best prep is: easy to use, tolerable, and effective for majority
- Identify clinical & demographic factors increase risk for poor prep



- *Email: Dissa@mednet.ucla.edu*
- *Twitter: [@DannyIssaMD](https://twitter.com/DannyIssaMD)*

