Bowel Prep

Priscilla Magno Pagatzaurtundua, MD MSc.

VA Caribbean Healthcare System


NO
conflicts
of interest

Bowel Prep: It is important

- 20%–25% of all colonoscopies have inadequate bowel prep
- Inadequate colonic preparation
  - reduced rates of ADRs
  - longer procedural time
  - lower cecal intubation rates
  - economic burden of repeating examinations

Gastroenterology 2014;147:903–924

AGA SECTION

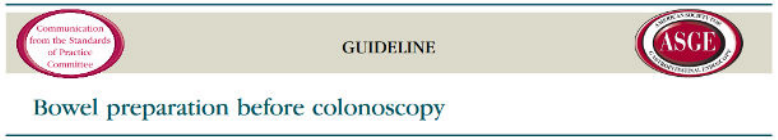
Optimizing Adequacy of Bowel Cleansing for Colonoscopy: Recommendations From the US Multi-Society Task Force on Colorectal Cancer

David A. Johnson,[1] Alan N. Barkun,[2] Larry B. Cohen,[3] Jason A. Dominitz,[4] Tonya Kaltenbach,[5] Myriam Martel,[2] Douglas J. Robertson,[6,7] C. Richard Boland,[8] Frances M. Giardello,[9] David A. Lieberman,[10] Theodore R. Levin,[11] and Douglas K. Rex[12]

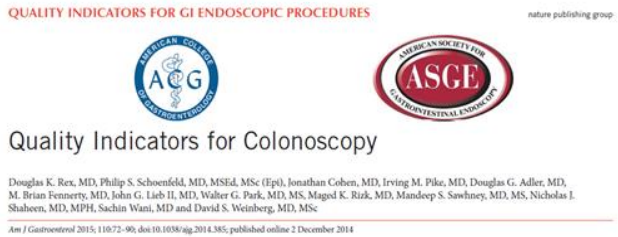
[1]Eastern VA Medical School, Norfolk, Virginia; [2]McGill University Health Center, McGill University, Montreal, Canada; [3]Icahn School of Medicine at Mount Sinai, New York, New York; [4]VA Puget Sound Health Care System and University of Washington, Seattle, Washington; [5]Veterans Affairs Palo Alto, Stanford University School of Medicine, Palo Alto, California; [6]VA Medical Center; [7]Geisel School of Medicine at Dartmouth, White River Junction, Vermont; [8]Baylor University Medical Center, Dallas, Texas; [9]Johns Hopkins University School of Medicine, Baltimore, Maryland; [10]Oregon Health and Science University, Portland, Oregon; [11]Kaiser Permanente Medical Center, Walnut Creek, California; [12]Indiana University School of Medicine, Indianapolis, Indiana

Bowel Prep Rating: Quality Indicator

- GI Societies
  - Documentation in ≥ 98%
    - Regardless of assessment/score scale
    - based on ability to identify polyps **after retained fluid or stool has been suctioned**
  - Minimum adequate bowel preparation rates of 85%-90%
    - For outpatient's bowel preparation **suitable for using recommended surveillance or screening intervals**


GUIDELINE

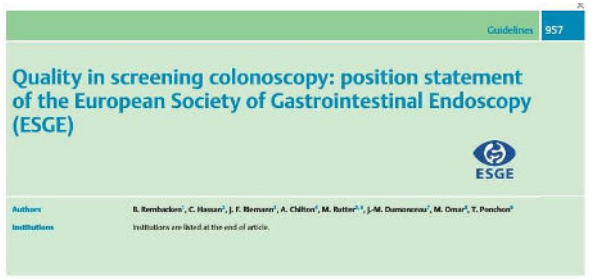
Bowel preparation before colonoscopy


QUALITY INDICATORS FOR GI ENDOSCOPIC PROCEDURES

nature publishing group

Quality Indicators for Colonoscopy

Douglas K. Rex, MD, Philip S. Schoenfeld, MD, MSEd, MSc (Epi), Jonathan Cohen, MD, Irving M. Pike, MD, Douglas G. Adler, MD, M. Brian Fennerty, MD, John G. Lieb II, MD, Walter G. Park, MD, MS, Maged K. Rizk, MD, Mandeep S. Sawhney, MD, MS, Nicholas J. Shaheen, MD, MPH, Sachin Wani, MD and David S. Weinberg, MD, MSc


Guidelines 957

Quality in screening colonoscopy: position statement of the European Society of Gastrointestinal Endoscopy (ESGE)

ESGE

Topics

- Risk Factors
- Diet prior to bowel cleansing
- Patient Education
- Bowel prep agent
- Dosing and timing of colon cleansing
- Rating Quality of Bowel Preparation during colonoscopy

Gastroenterology 2014;147:903–924

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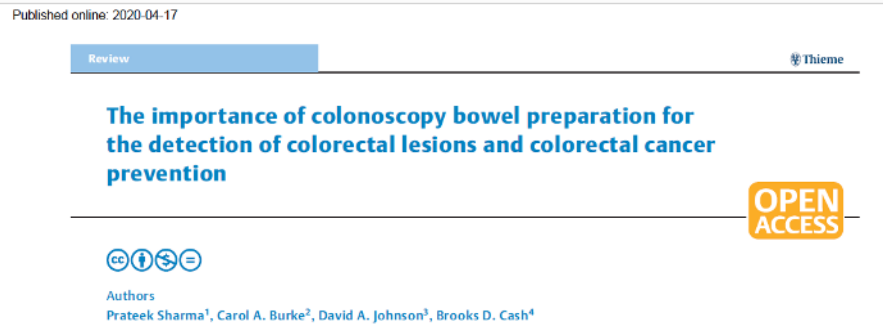
Risk Factors Inadequate Bowel Prep


Published online: 2020-04-17

Review

Thieme

The importance of colonoscopy bowel preparation for the detection of colorectal lesions and colorectal cancer prevention

OPEN ACCESS

Authors
Prateek Sharma[1], Carol A. Burke[2], David A. Johnson[3], Brooks D. Cash[4]

- Constipation < 3 BMs/week
  - **OR, 5.2**; 95% CI, 1.8-15.2
- Diabetes Mellitus
  - **OR, 3.5**; 95% CI, 1.4-8.7)1
- Medications
  - Opioids: **OR, 1.7**; 95% CI, 1.4-2.1
    TCAs: **OR, 2.0**; 95% CI, 1.4-2.9
- Non-compliance to dosing, timing of preparation or diet
  - **OR, 6.7**; 95% CI, 3.2-14.2
- Obesity
- Dementia, Parkinson, Spinal Cord
- Cirrhosis
- Male

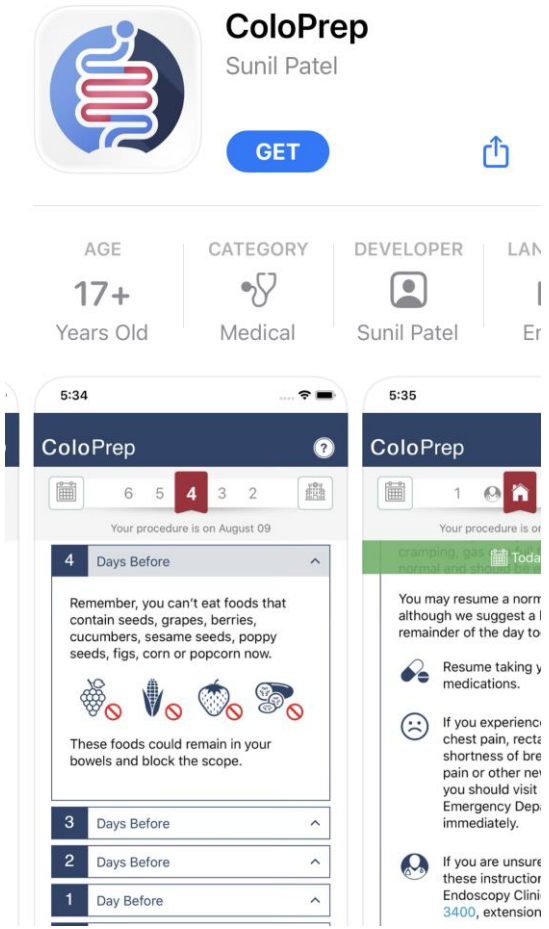
Sharma et al. Endoscopy International 2020
Lee et at. Medicine (Baltimore) 2017
Gandhi et al. Clin Gastroenterol Hepatol 2018
Rex DK Nat Rev Gastroenterol Hepatol 2014
Hassan et al. Clin Gastroenterol Hepatol 2012

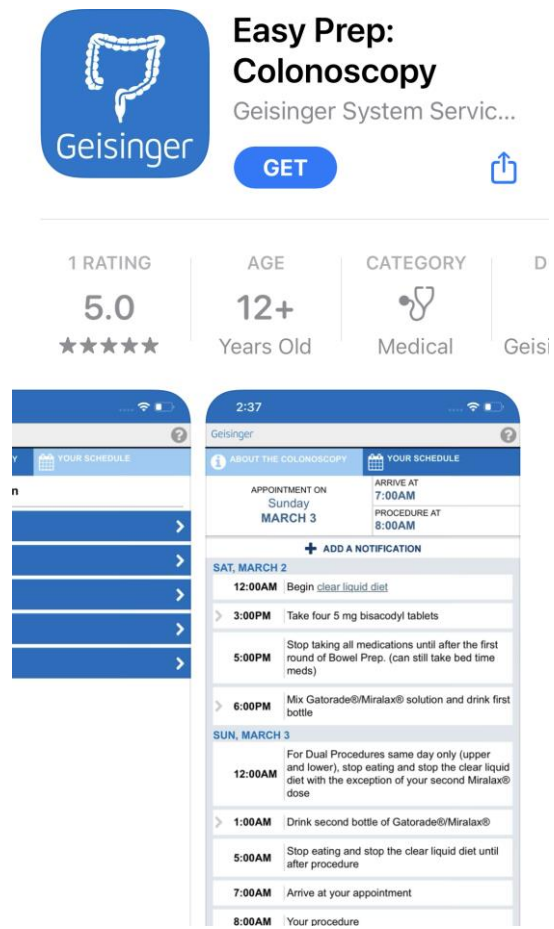
Patient Instructions

- Verbal and written instructions
- Read the instructions at least a week prior to the colonoscopy
- GI Nursing Staff phone calls, trained patient navigators

Digital tools have been used to augment bowel preparation instructions

Smartphone applications
Web-based videos





Diet

- Traditionally, clear liquid
- Hydration - better preparation and fewer adverse events (ie, nausea) related to the prep

- Low-residue diet for part or all day before colonoscopy
- Evaluate any compromise in efficacy if dietary flexibility is allowed

Low Fiber Diet for Colonoscopy

Foods that are okay	Foods that are not okay
White bread	Whole wheat bread or pasta
White rice or noodles	Brown or wild rice
Plain crackers and potato rolls	Whole wheat crackers and Rolls
Skinless cooked potato	Raw or partially cooked vegetables
Skinless chicken or turkey	Tough meat or meat items with skin
Fish and other sea foods	Nuts, seeds, popcorn, and fruits
Canned fruits without seeds or skin	Milk or milk products
Eggs	Cereals
Vanilla wafers, Animal crackers	Granola, Cornbread, Pumpernickel bread
Items on the clear liquid diet	Items on the high fiber diet

Low-Residue Diet

- (n = 660) 92% male; mean age 64
- LRD menu & Split-dose 2LPEG

- 94% BBPS ≥ 2 in each segment
- Inadequate BP
  - Higher BMI, DM, prior inadequate BP, BP duration of two days, opioid use
- Predictor of inadequate BP
  - BMI ≥ 25 kg/m2 (OR 1.06, 95% CI 1.01–1.12,p = 0.03)
  - Every one-unit increase associated with a 6% increased odds

PLOS ONE

RESEARCH ARTICLE

Low-residue diet for colonoscopy in veterans: Risk factors for inadequate bowel preparation and patient satisfaction and compliance

Chethan Ramprasad[1], Sandy Ng[1], Yian Zhang[2], Peter S. Liang[1,3]*

1 Department of Medicine, NYU Langone Health, New York, New York, United States of America, 2 Division of Biostatistics, Department of Population Health and Environmental Medicine, NYU Langone Health, New York, New York, United States of America, 3 Department of Medicine, VA New York Harbor Health Care System, New York, New York, United States of America

PLOS ONE ttps://doi.org/10.1371/journal.pone.0233346 May 21, 2020

Bowel Prep: Criteria Definition

- No standard criteria or definition exists
  - qualitative terms “adequate”, “inadequate”, “excellent”, “good”, **“fair”,** or “poor”

- ASGE/ACG Task Force definition of **“Adequate”**
  - if it allows detection of polyps > 5 mm in size

Bowel Prep Scales

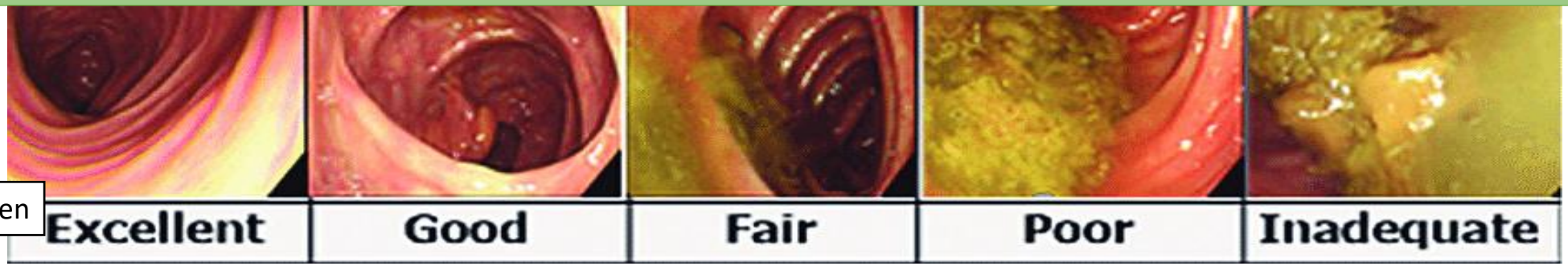
Aronchick Scale

- First bowel preparation quality scale
- Most used in clinical trials and practice
- Performed before washing or suctioning
- **% of the total colonic mucosal surface covered by fluid or stool**
- No scoring for separate colon segments

Aronchick CA. Gastrointest Endosc 2004
Aronchick CA et al. Validation of an instrument to assess colon cleansing. Am J Gastroenterol 1999

Good	Large volume of clear liquid covering 5–25% of the surface but >90% of surface seen
Fair	Semi-solid stool that could be suctioned or washed away but >90% of surface seen
Poor	Semi-solid stool that could not be suctioned or washed away and <90% of surface seen

Interobserver correlation coefficients (ICCs) – kappa coefficients
high for cecum (0.76) & total colon (0.77)
reduced distal and ascending colon segments

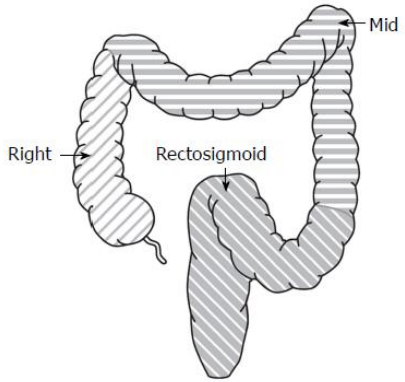


> 95% of surface seen

Ottawa Bowel Prep Scale

- <u>Performed before washing or suctioning</u>
- **Scoring for separate colon segments**
  - right colon, mid-colon, and rectosigmoid
- **Scoring for fluid quantity**
- Total score (adding scores for each segment + total colon fluid score)

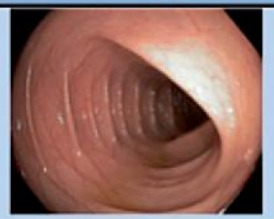
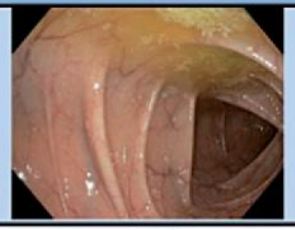
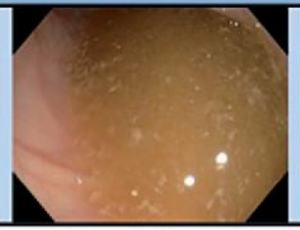
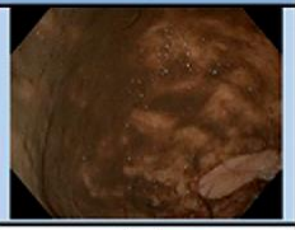
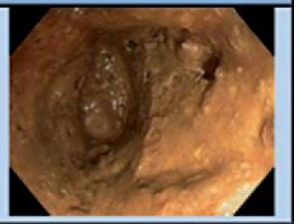
Kastenberg D *et al*. Bowel preparation quality scales

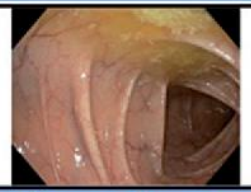
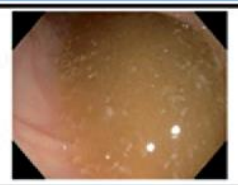
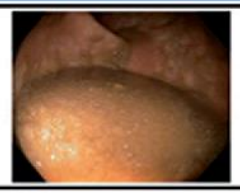


- ICCs and consistency ratings were significantly superior for the OBPS *vs* the Aronchick

Rostom A et al. Gastrointest Endosc 2004

Good	Large volume of clear liquid covering 5–25% of the surface but >90% of surface seen
Fair	Semi-solid stool that could be suctioned or washed away but >90% of surface seen
Poor	Semi-solid stool that could not be suctioned or washed away and <90% of surface seen
Inadequate	Re-preparation needed

OBPS (A)	0	1	2	3	4
0=Excellent 1=Good 2=Fair 3=Poor 4=Inadequate					
LC ☐	☐	☐	☐	☐	☐
TC ☐	☐	☐	☐	☐	☐
RC ☐	☐	☐	☐	☐	☐

OBPS (B)	0	1	2
☐	 ☐	 ☐	 ☐

OBPS (A+B) = ☐

Scale from 0 (excellent) to 14 (inadequate)

Score cutoff of ≥ 8 identified
inadequate bowel prep
sensitivity 100%
specificity 91%

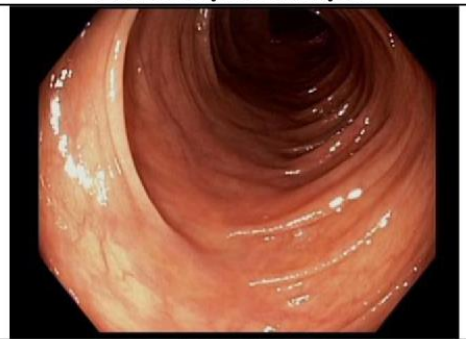
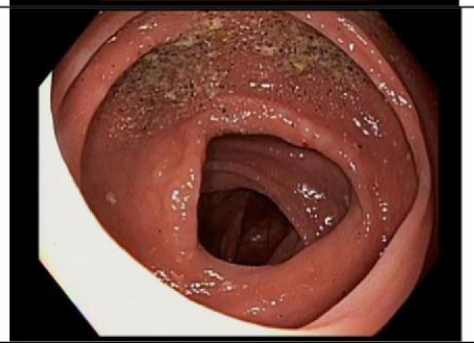
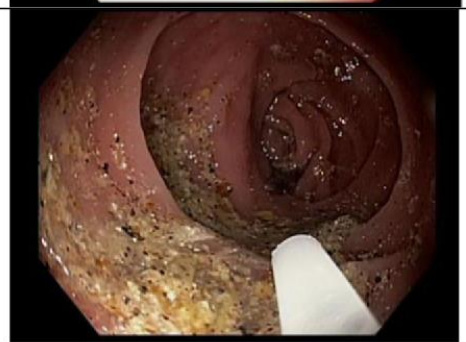
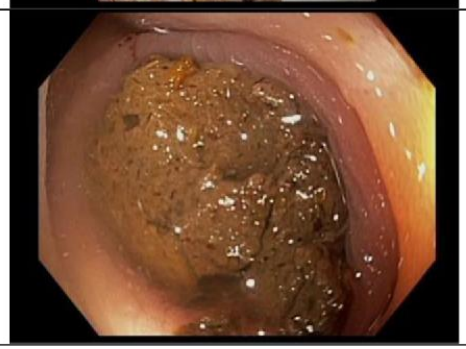
Colon Fluid Single Score
0: small amount of fluid
1: moderate amount
2: large amount

Chan et al. Ottawa score of 8 or greater is an optimal cut-off score for inadequate bowel preparation. Am J Gastroenterol 2011

Boston Bowel Prep Score

- Performed upon withdrawal and after all flushing & suctioning have been completed
- **Score applied by colon segments**
- Subjective, qualitative terms are replaced by numbered scores

Lai EJ et al. The Boston bowel preparation scale: a valid and reliable instrument for colonoscopy-oriented research. Gastrointest Endosc 2009

Score	Description	Endoscopic example
3	Entire mucosa of colon segment seen well, with no residual staining, small fragments of stool, or opaque liquid	
2	Minor amount of residual staining, small fragments of stool, and/or opaque liquid, but mucosa of colon segment is seen well	
1	Portion of mucosa of the colon segment seen, but other areas of the colon segment are not well seen because of staining, residual stool, and/or opaque liquid	
0	Unprepared colon segment with mucosa not seen because of solid stool that cannot be cleared	

Rutherford C et al. Current Treatment Options in Gastroenterology 2018

BBPS: Adequacy for 10-yr FU

- Validation Studies
  - Median BBPS was 6
    - ICC interobserver total BBPS 0.74
    - Kappa intraobserver total BBPS 0.77
  - 100% raters (12) judged the bowel preparation adequate to exclude polyps > 5 mm with a = 8 BBPS score
    - vs 82% when the score was 6
    - **vs 33% when the score was 5**
  - **Total score of = 6 *and* all segment scores = 2 should be required as an adequacy standard for 10-year follow-up**
  - **BBPS segment scores of 2 or 3 (with 2 being noninferior to 3) are adequate** bowel preparation for detection of adenomas > 5 mm

Lai EJ et al. Gastrointest Endosc 2009
Calderwood et al. *Gastrointest Endosc* 2010
Kluge et al. Gastrointest Endosc 2018
Clark et al. Gastroenterology 2016

Other Validated Bowel Prep Scores

- Harefield Cleansing Scale
- Chicago Bowel Preparation Scale

- A standard, fully validated and universally accepted scale for use in clinical practice and trials has not yet been established

Recommended Follow-Up Intervals for Inadequate Prep

Gastroenterology 2014;147:903–924

AGA SECTION

Optimizing Adequacy of Bowel Cleansing for Colonoscopy: Recommendations From the US Multi-Society Task Force on Colorectal Cancer

Preliminary assessment in sigmoid colon

- Terminate exam & reschedule **OR** provide additional cleansing without cancelling

If completed to cecum

- Reschedule within a year or shorter interval if advanced neoplasia was detected during exam

Assessment after all appropriate efforts to clear residual debris to detect lesions > 5 mm

Minimum adequate bowel preparation rates of 85%

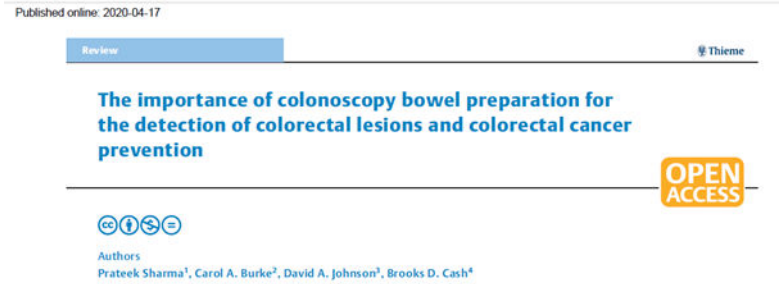
Dosing of Bowel Prep Agents

- Day before colonoscopy:
  - chyme from the small intestine enters the colon and accumulates, producing a film that coats the proximal colon and impairs detection of flat lesions

- Length of time between the last dose of preparation and the initiation of colonoscopy correlates with the quality of the proximal colon

Siddiqui et al. Gastrointest Endosc 2009
Mormo et al. Gastrointest Endosc 2010

Split-Dose


Published online: 2020-04-17

Review

Thieme

The importance of colonoscopy bowel preparation for the detection of colorectal lesions and colorectal cancer prevention

OPEN ACCESS

Authors

Prateek Sharma[1], Carol A. Burke[2], David A. Johnson[3], Brooks D. Cash[4]

- Half of the bowel cleansing dose given on the day of the colonoscopy

- Meta analysis studies
  - Superior both efficacy and tolerability compared with day-before dosing
  - Leads to higher ADRs
  - Patient willingness to repeat preparation
  - Decreased incidence of nausea

  - Same-day prep during AM for colonoscopy in PM provide similar efficacy to split-dose regimen

Kilgore et al. Gastrointest Endosc 2011
Martel et al. Gastroenterology 2015
Avalos et al. J Clin Gastroenterol 2017
Sharma et al. Endoscopy International 2020

Timing & Dosing

- Split-dose bowel preparation
  - Begin second half dose 4 to 6 hours before procedure time
  - Complete second half dose ≥ 2 to 5 hours before the procedure time
- Same-day preparation as an alternative to 2-day split-dosing for afternoon colonoscopy

Bowel Prep Preparation

Davis GR, Santa Ana CA, Morawski SG et al.
Development of a lavage solution associated with minimal water and electrolyte absorption or secretion.
Gastroenterology 1980; 78: 991–995

May 2010 – 2017 (generic)

November 2018

Low-volume PEG May 2018

November 2020

Types of Preparations

Isosmotic

- High-volume (4L)
  - GoLYTELY & CoLyte
  - NuLytely & TriLyte (sulfate-free)
- Low-volume PEG (2-3L)
  - Moviprep & Plenvu (ascorbic acid)
  - Gavilyte-H and bisacodyl, PEG-Prep and bisacodyl

Hyperosmotic

- Sodium sulfate-based preparations
  - SuPrep
  - Sutab
- Sodium phosphate-based preparations
  - Osmoprep

Combination

- Sodium picosulfate (stimulant laxative) + magnesium oxide & citric acid (osmotic laxatives)
  - Prepopik
  - Clenpiq

- High-volume PEG
  - Older patient > 65 y/o
  - Chronic constipation
  - Previous inadequate bowel preparation
  - No tolerance to fluid or electrolyte shifts
    - congestive heart failure or hepatic or renal failure
  - Pregnancy (Category C)
  - IBD
  - Bariatric (extended time or low-volume)

- Low-volume PEG
  - Better taste - sulfate-free, low potassium
  - Avoid ascorbic acid in glucose-6-phosphate dehydrogenase deficiency

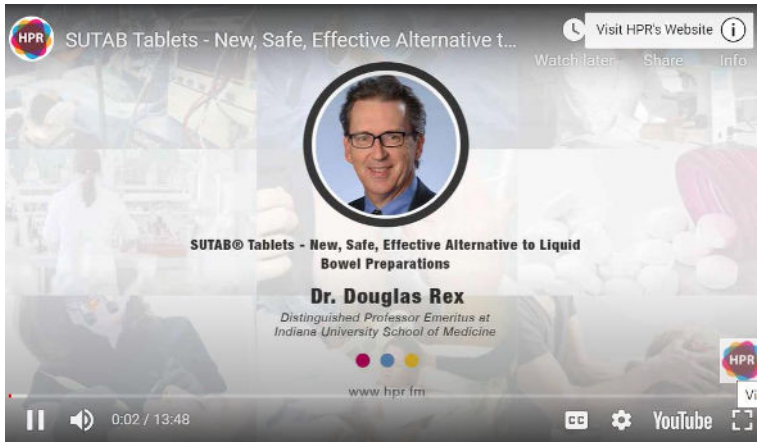
Isosmotic

- <u>High-volume (4L)</u>
  - GoLYTELY & CoLyte
  - NuLytely & TriLyte (sulfate-free)
- <u>Low-volume (2-3L)</u>
  - Moviprep & Plenvu (ascorbic acid)
  - Gavilyte-H and bisacodyl, PEG-Prep and bisacodyl

- Sodium Sulfate
  - No significant fluid and electrolyte shifts
  - Only tested in patients without comorbidities
  - Effective as PEG preparations

A Phase 2 Randomized Trial of DCL-101, a Novel Pill-Based Colonoscopy Prep, vs 4L Polyethylene Glycol-Electrolyte Solution

Dale R. Bachwich, MD[1], James D. Lewis, MD, MSCE[2], Vera O. Kowal, MD[1], Brian C. Jacobson, MD, MPH[3], Audrey H. Calderwood, MD, MS[4] and Michael L. Kochman, MD[5]



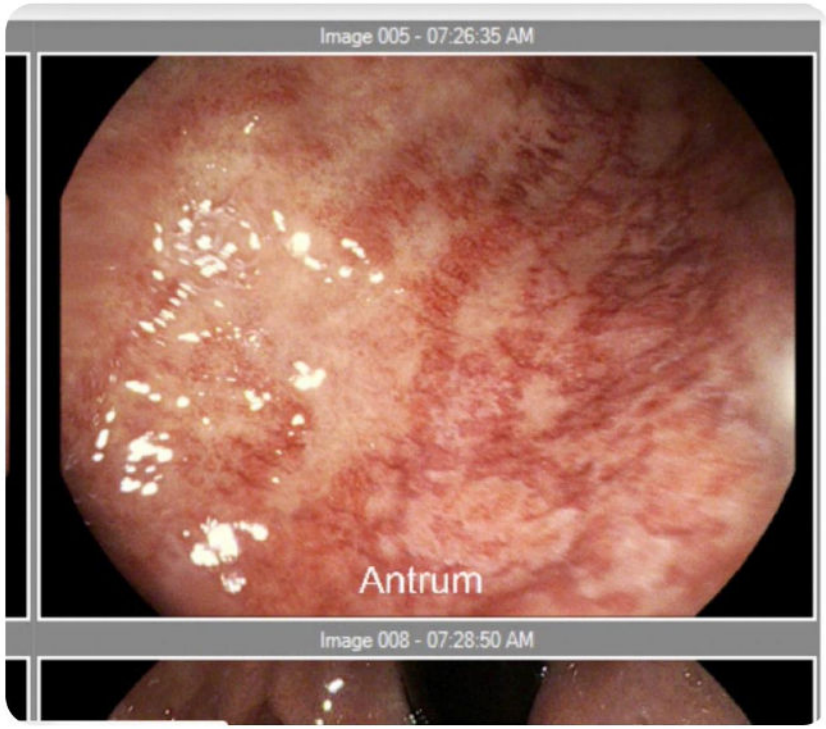
- Sodium Phosphate
  - FDA “black box warning” 2008
    - Seizures, nephropathy, fluid, e-lites imbalance, mucosal damage

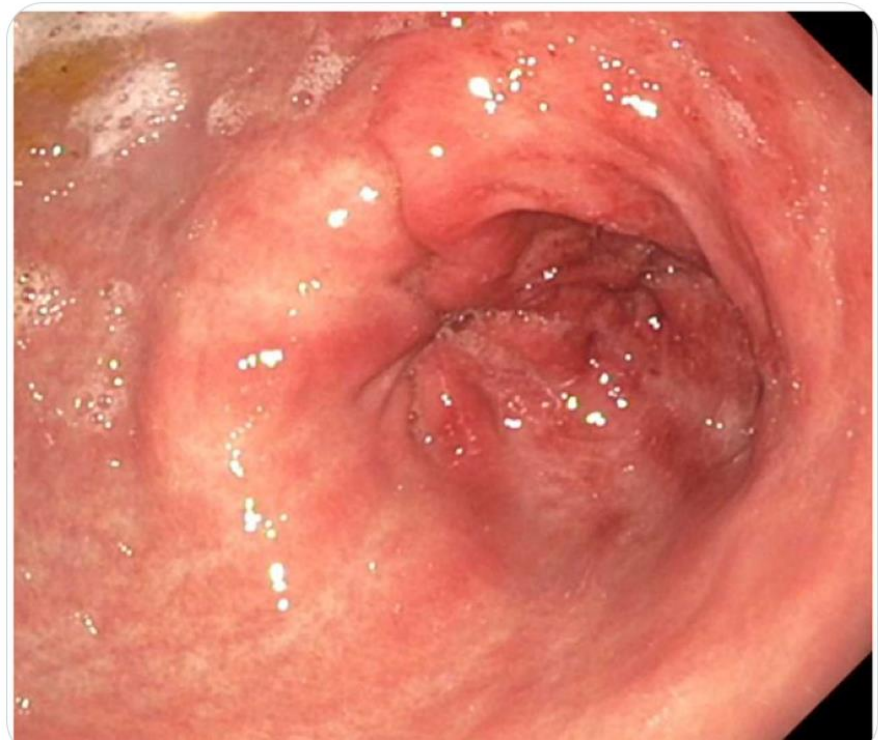
Hyperosmotic

- Sodium sulfate-based preparations
  - SuPrep
  - Sutab
- Sodium phosphate-based preparations
  - Osmoprep
  - Visicol

Clinical and Translational Gastroenterology 2020

When doing a double, I've been seeing more gastritis on #endoscopy like this when using #Sutab for the #colonoscopy. Anyone else? I don't have data but would love your thoughts! #GITwitter #medtwitter





The KCl in Sutab is about equal to 30 mEq of KCl divided in 12 aliquots. It may be enough to cause foregut mucosal injury in a minority of people? esp if it lingers in the stomach (not enough water, gastroparesis, etc)

- Sodium picosulfate
  - Avoid in heart failure, renal insufficiency, end-stage liver disease, or electrolyte abnormalities because of the potential for electrolyte shifts
  - Similar efficacy compared with PEG-3350 preparations

Combination

• Sodium picosulfate (stimulant laxative) + magnesium oxide & citric acid (osmotic laxatives)
  • Prepopik
  • Clenpiq

PLENVU

32 oz

MANGO  FRUIT PUNCH

AT LEAST 32 oz

PLUS ADDITIONAL CLEAR LIQUIDS TO BE CONSUMED AFTER EACH DOSE

64 OZ

PLUS ADDITIONAL LIQUIDS CONSUMED

Suprep®

32 oz

AT LEAST 64 oz

96 OZ

Sutab®

24 TABLETS

96 oz
WATER ONLY

ADDITIONAL CLEAR LIQUIDS MAY BE CONSUMED

x 24

+

96 OZ

MoviPrep®

64 oz

AT LEAST 32 oz

AT LEAST

96 OZ

Clenpiq®

11 oz

AT LEAST 72 oz

AT LEAST

83 OZ

Golytely®

128 oz

ADDITIONAL CLEAR LIQUIDS MAY BE CONSUMED

AT LEAST

128 OZ

Other Preparations

- Magnesium Citrate
  - Hyperosmotic preparation (15 oz. in AM and PM)
  - Can cause fluid and electrolyte shifts
    - Renal insufficiency (hypermagnesemia)
    - Heart failure and d-CLD

- Miralax and bisacodyl
  - no clinically significant change in serum electrolytes
    - Hyponatremia
    - Sport drinks – fermentation produce explosive hydrogen gas (as mannitol)

Other Preparations

- Senna
  - High-dose senna (24 tablets of 12 mg each) was as effective as 4 L PEG-ELS in 2 studies (more cramps and abdominal pain
  - Low-dose senna (3–12 tablets) with 2 L PEG-ELS to increase its cleansing effect

Timing of Bowel Prep Agent

- Suboptimal preparation is increased for colonoscopies scheduled later in the day
  - OR, 1.9; 95% CI, 1.7−2.1
- Length of time between the last dose of preparation and the initiation of colonoscopy
  - good/excellent preparation decreases by 10% for each hour
- Prospective observational study
  - **3 to 5 hours** between the last dose of PEG and the start of the colonoscopy provided best prep

Lebwohl et al. Dig Dis Sci 2010
Siddiqui et al. Gastrointest Endosc 2009
Seo et al. Gastrointest Endosc 2012

▶ **Table 3** Factors that can improve bowel preparation quality [67, 76–84].

Product-related factors	Patient-related factors
Tolerability ▪ Low preparation volume ▪ Adequate palatability **Dosing regimen** ▪ Split-dosing (2-day or same day of colonoscopy) **Timing of administration** ▪ Final dose completed within 2 to 5 hours before the start of the procedure	**Adherence to instructions** ▪ Patient education ▪ Health literacy ▪ Motivation

Table created with data from Johnson DA, et al. Gastroenterology 2014; 147: 903–924; Guo X, et al. Gastrointest Endosc 2017; 85: 90–97 e96; Mamula P, et al. Gastrointest Endosc 2009; 69: 1201–1209; Smith SG, et al. Dis Colon Rectum 2012; 55: 1074–1080; Cipolletta L, Rotondano G. Dig Liver Dis 2013; 45: 16–17; Kilgore TW, et al. Gastrointest Endosc 2011; 73: 1240–1245; Martel M, et al. Gastroenterology 2015; 149: 79–88; Horton N, et al. Am J Gastroenterol 2016; 111: 1330–1337; Avalos DJ, et al. J Clin Gastroenterol 2017; 52: 859–868; Seo EH, et al. Gastrointest Endosc 2012; 75: 583–590.

Published online: 2020-04-17

Review

Thieme

The importance of colonoscopy bowel preparation for the detection of colorectal lesions and colorectal cancer prevention

OPEN ACCESS

Authors
Prateek Sharma[1], Carol A. Burke[2], David A. Johnson[3], Brooks D. Cash[4]

Sharma et al. Endoscopy International 2020

Intolerance to Bowel Prep Agent

- Allow a fiber-free diet
- Low preparation volume
- Sulfate-free solutions
- Chilling the solution & use a straw
- Sucking on lemon slices, sugar-free menthol candy drops
- Interrupt intake 1-2 hours or slow the rate of consumption
- Inpatients: NGT

Intolerance to Bowel Prep Agent

- History of vomiting
  - ondasetron, promethazine, metoclopramide AND spilt-dose BP
  - 2-3 10 mg bisacodyl tabs q 6-8 hours the day prior to the exam & large volume tap water enemas until clear in the unit

- Vomiting de novo – ensure vomiting has stopped
  - 1st split dose:, 10 mg of bisacodyl and/or 10 oz. magnesium citrate; antiemetic as needed
  - 2nd split dose: ask about color of effluent, 10 mg of bisacodyl and magnesium citrate

History of Inadequate Bowel Prep

- Check for compliance with diet, timing and dosing of prep agent

- Two days of clear liquids & AM procedure, split-dosing 4L PEG
  - Miralax week before
  - magnesium citrate if there are no contraindications

- Repeating bowel prep agent administration
  - In tandem over a two-day period
  - 3 days apart under clear diet

Adjuncts to Colon Cleansing Before Colonoscopy

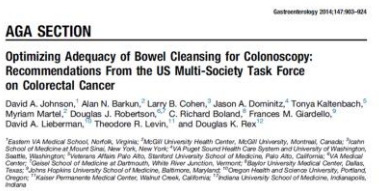
Recommendation

1. The routine use of adjunctive agents for bowel cleansing before colonoscopy is not recommended (***Weak recommendation, moderate-quality evidence***)

Simethicone, flavored electrolyte solutions, prokinetics, spasmolytics, bisacodyl, senna, olive oil, and probiotics

No improved efficacy, safety, or tolerability of bowel prep

Agents may be useful in select circumstances, at the discretion of the prescribing physician



Gastroenterology 2014;147:903–924

AGA SECTION

Optimizing Adequacy of Bowel Cleansing for Colonoscopy: Recommendations From the US Multi-Society Task Force on Colorectal Cancer

David A. Johnson,[1] Alan N. Barkun,[2] Larry B. Cohen,[3] Jason A. Dominitz,[4] Tonya Kaltenbach,[5] Myriam Martel,[2] Douglas J. Robertson,[6,7] C. Richard Boland,[8] Frances M. Giardello,[9] David A. Lieberman,[10] Theodore R. Levin,[11] and Douglas K. Rex[12]

[1]Eastern VA Medical School, Norfolk, Virginia; [2]McGill University Health Center, McGill University, Montreal, Canada; [3]Icahn School of Medicine at Mount Sinai, New York, New York; [4]VA Puget Sound Health Care System and University of Washington, Seattle, Washington; [5]Veterans Affairs Palo Alto, Stanford University School of Medicine, Palo Alto, California; [6]VA Medical Center, [7]Geisel School of Medicine at Dartmouth, White River Junction, Vermont; [8]Baylor University Medical Center, Dallas, Texas; [9]Johns Hopkins University School of Medicine, Baltimore, Maryland; [10]Oregon Health and Science University, Portland, Oregon; [11]Kaiser Permanente Medical Center, Walnut Creek, California; [12]Indiana University School of Medicine, Indianapolis, Indiana

Salvage Options for Inadequate Preparation

There is insufficient evidence to recommend a single salvage strategy for those patients encountered with a poor preparation that precludes effective completion of the colonoscopy. The following options can be considered in such cases:

Recommendations

1. Large-volume enemas can be attempted for patients who, presenting on the day of colonoscopy, report brown effluent despite compliance with the prescribed colon-cleansing regimen (***Weak recommendation, very low quality evidence***)
2. Through-the-scope enema with completion colonoscopy on the same day can be considered, especially for those patients who receive propofol sedation (***Weak recommendation, very low quality evidence***)
3. Waking the patient entirely from sedation and continuing with further oral ingestion of cathartic with same-day or next-day colonoscopy has been associated with better outcomes than delayed colonoscopy (***Weak recommendation, low-quality evidence***)

Gastroenterology 2014;147:903–924

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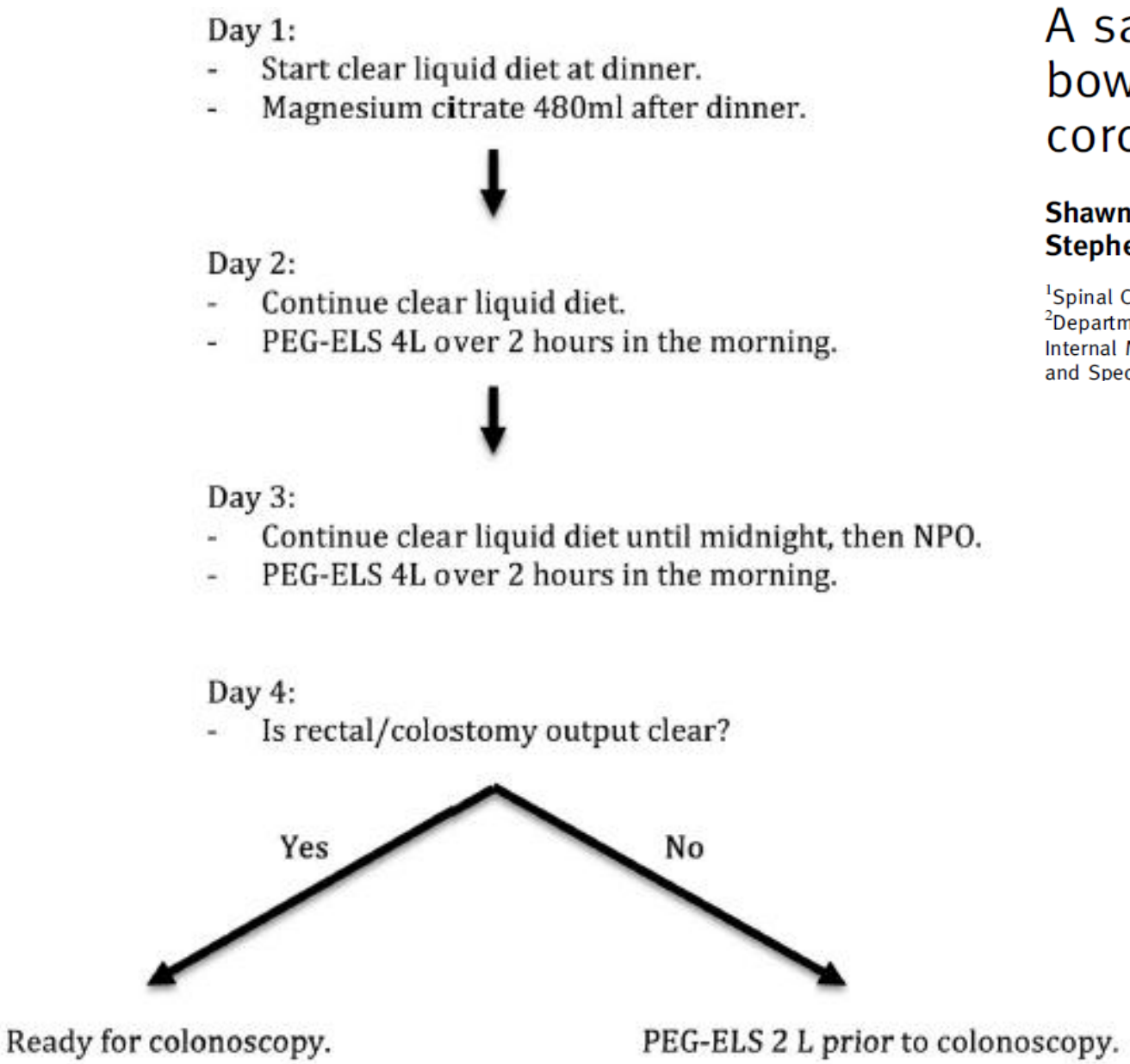
Hospitalized Patients

- Inability to tolerate preparation
- Slow bowel transit
- Immobilization
- Acute illness MICU/CCU
- Motility altering medications



Research Article

A safe and effective multi–day colonoscopy bowel preparation for individuals with spinal cord injuries

Shawn H. Song [1,2], Jelena N. Svircev[1,2], Brandon J. Teng[3], Jason A. Dominitz[3,4], Stephen P. Burns[1,2]

[1]Spinal Cord Injury Service, Veterans Affairs Puget Sound Health Care System, Seattle, Washington, USA, [2]Department of Rehabilitation Medicine, University of Washington, Seattle, Washington, USA, [3]Department of Internal Medicine, University of Washington, Seattle, Washington, USA, [4]Division of Gastroenterology, Hospital and Specialty Medicine Service, Veterans Affairs Puget Sound Health Care System, Seattle, Washington, USA

- Rectal exam as needed to facilitate complete evacuation following each bowel movement
- 89% of patients (53) had adequate bowel cleansing at colonoscopy

Shawn et al. J of Spinal Cord 2018

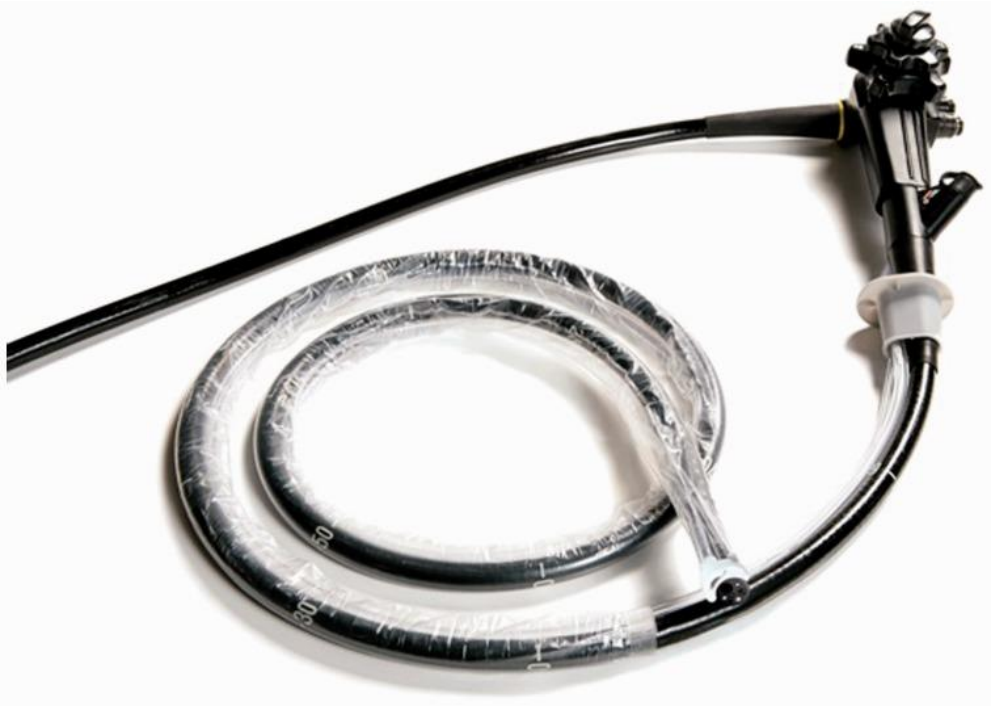
UNITED EUROPEAN GASTROENTEROLOGY ueg journal OPEN ACCESS

United European Gastroenterol J. 2016 Feb; 4(1): 105–109.
Published online 2015 Apr 28. doi: 10.1177/2050640615583409

PMCID: PMC4766543
PMID: 26966530

Feasibility study of minimal prepared hydroflush screening colonoscopy

Menachem Moshkowitz,[1,2,3] Ahmad Fokra,[1,3] Yoseph Itzhak,[4] Nadir Arber,[1,2,3] and Erwin Santo[2,3]



ClearPath® (Easy-Glide, Kfar Truman, Israel)

Neumann et al. BMC Gastroenterol (2021) 21:232
https://doi.org/10.1186/s12876-021-01817-2

BMC Gastroenter

RESEARCH Open A

A multicenter, prospective, inpatient feasibility study to evaluate the use of an intra-colonoscopy cleansing device to optimize colon preparation in hospitalized patients: the REDUCE study

Helmut Neumann[1], Melissa Latorre[2], Tim Zimmerman[1], Gabriel Lang[3], Jason Samarasena[4], Seth Gross[2], Bhaumik Brahmbhatt[5], Haleh Pazwash[6] and Vladimir Kushnir[3*]

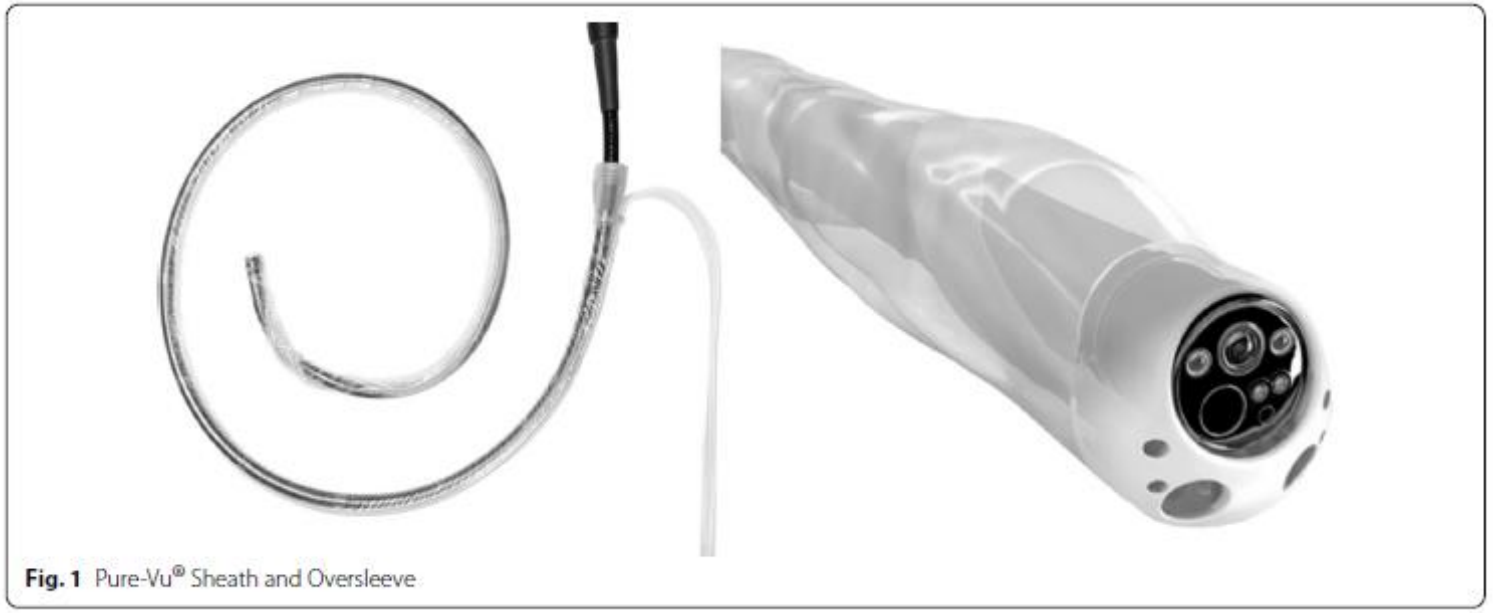
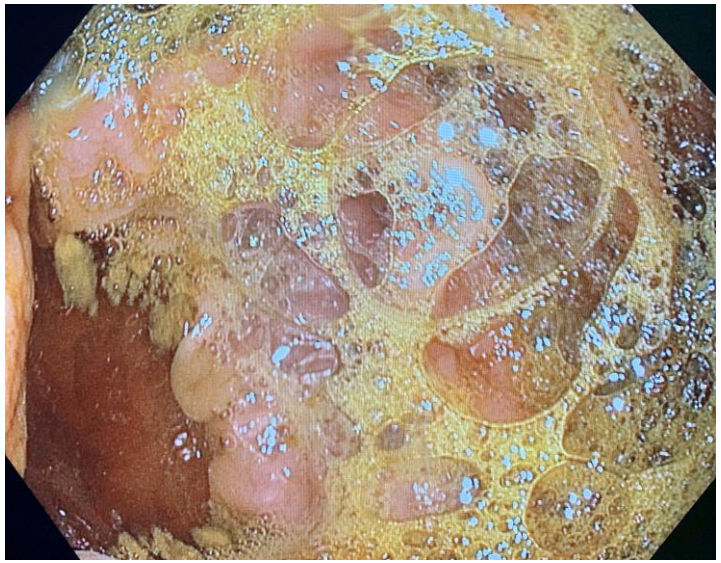
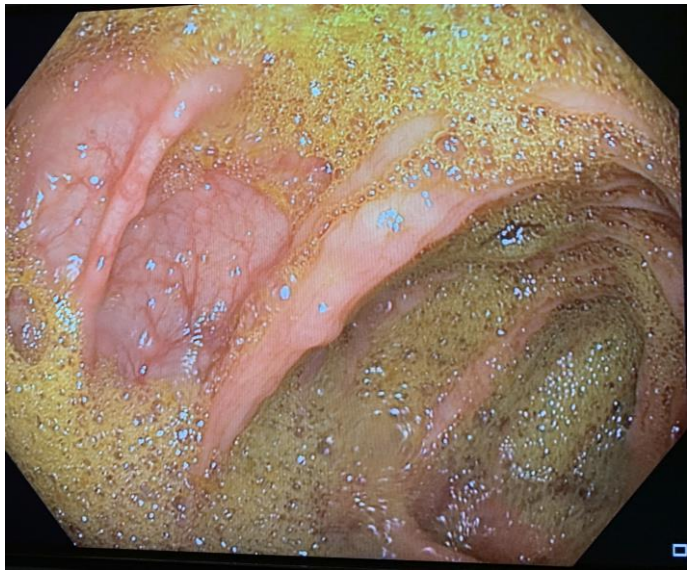


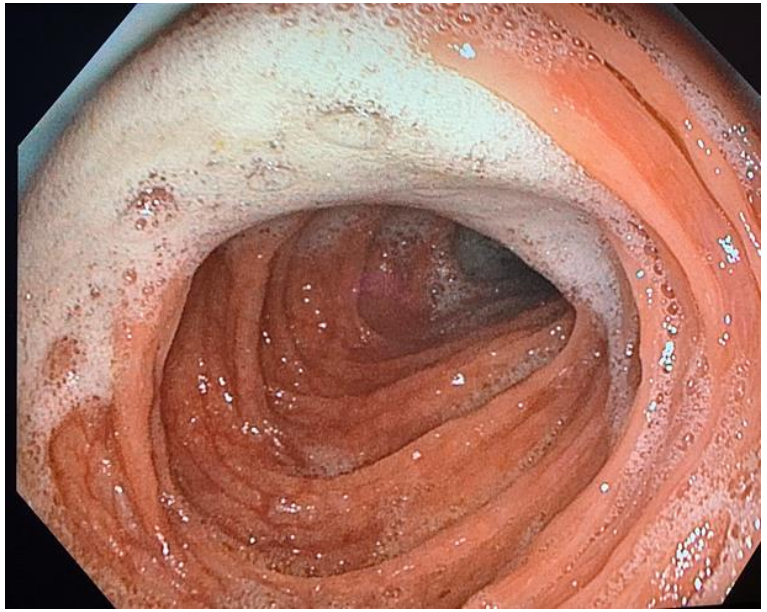
Fig. 1 Pure-Vu® Sheath and Oversleeve

- Single use, disposable oversleeve fits over the scope and connected to a workstation
- System generates a mixture of water and air that creates a high intensity pulsed vortex
- Fecal matter and fluids are simultaneously removed through two suction ports

Bubbles!!



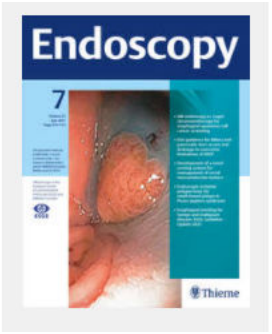




Colonic Bubbles

- Described in 30 to 40% of colonoscopies
- Validated bowel prep scales do not address the problem or possible actions
- Low-volume PEG solution containing ascorbic acid

Bubble Score



Endoscopy
DOI: 10.1055/a-1331-4325
Download PDF
Original article

The Colon Endoscopic Bubble Scale (CEBuS): a two-phase evaluation study

Filipe Taveira, Cesare Hassan, Michal F. Kaminski, Thierry Ponchon, Robert Benamouzig, Marek Bugajski, Flore de Castelbajac, Paola Cesaro, Hasnae Chergui, Loredana Goran, Leonardo Minelli Grazioli, Martin Janičko, Wladyslaw Januszewicz, Laura Lamonaca, Jamila Lenz, Lucian Negreanu, Alessandro Repici, Cristiano Spada, Marco Spadaccini, Monica State, Jakub Szlak, Eduard Veseliny, Mário Dinis-Ribeiro, Miguel Areia
› Author Affiliations

- Degree of obscuration by bubbles, bile, or debris as follows:
  - 0: < 50% of mucosa seen, severe obscuration
  - 1: 50% – 75% of mucosa seen, moderate obscuration)
  - 2: (80% – 95% of mucosa seen, mild obscuration)
  - 3: (> 95% of mucosa seen, no obscuration)

- CEBuS
  - CEBus-0: no or minimal bubbles covering < 5 % of the surface
  - CEBuS-1: bubbles covering 5 %– 50 %
  - CEBuS-2: bubbles covering > 50 %

    -ICC 0.83 (0.73-0.89) and 0.90 (0.86-0.94)
  - Reporting clinical action (do nothing; wash with water; wash with simethicone)
    - ICC 0.63 (0.43-0.78) in Phase 1 and 0.77 (0.68-0.84) in Phase 2

Yoo et al Improving of bowel cleansing effect for polyethylene glycol with ascorbic acid using simethicone. Medine (Baltimore) 2016

Simethicone

- Dosage of 120 - 240 mg, or 45 mL of a 30% solution
- Through-the-scope may result in residue and persistent contamination in the endoscopic channels despite utilizing HLD and adherence to reprocessing methods
- Concerns about transmitting infection through contaminated endoscopes
- No confirmed cases of infection related to simethicone use

Gastroenterology 2014;147:903–924

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High or low-volume prep, split-dose

Assessment after all appropriate efforts to clear residual debris to detect lesions > 5 mm

Minimum adequate bowel preparation rates of 85% (BBP $\geq$ 6) & document

Recommended Follow-Up Intervals for Inadequate Prep