

BREAKING THE **MOLD**

43rd Annual Course

May 22–24, 2016 | Seattle, Washington

Pre-meeting events: May 20–21

EVERYBODY PREPS OR DO THEY?

Judith Currier BSN RN CGRN and MaryJo Miller BSN RN CGRN

OBJECTIVES

- Distinguish the differences between bowel preparations and their implications for successful colonoscopy
- Identify the complications of ineffective bowel preparations.
- Discuss effective patient teaching methods for optimal results.

In the beginning we had
Rigid Sigmoidoscopy
Flexible Sigmoidoscopy
Flexible Colonoscopy

The Scopes

Rigid Scope



Flexible Scope



Accurate colonoscopy is dependent on thorough cleansing of the colon and rectum.

The evolution of the bowel prep



"How many enemas did you give him ?"

The Early Colon Preps

- Clear liquid diet
- Tap water enemas till clear
- Cathartics
 - Citrate of Magnesium

- Mannitol, sorbitol and lactulose- used in the past, and are non absorbable carbohydrates. They are fermented by colonic bacteria and produce combustible methane and hydrogen gases. These gases increase the risk of intra-colonic explosion with the use of electrocautery and APC.

The New Wave



BOWEL PURGATIVES

Categorized into three types

- Isosmotic agents
- Hyperosmotic agents
- Stimulants

ISOSMOTIC AGENTS

- High Volume Polyethylene Glycol Preparations (PEG)
 - The Gold Standard
- Sulfate-Free Polyethylene Glycol Preparations (PEG-ELS)
- Low Volume Polyethylene Glycol Preparation with Ascorbic Acid

ISOSMOTIC PREPARATIONS

- PEG are most commonly used
- Act as a high volume, osmotically balanced non-absorbable solution.
- Limits fluid exchange across the colon membrane which minimizes net loss of water or electrolytes

- Commercially available preparations: full volume (4liter) prep vs. a low volume (2liter) prep
- Full volume:
 - Golytely (flavored or unflavored),Colyte
 - Nulytely, Trilyte (sulfate free, flavored)

COMMON RESULT PEG PREP



Low Volume PEG ELS

- Halflytely - 2L PEG plus bisacodyl 10mg
- Moviprep - contains ascorbic acid to enhance osmotic effects and improve taste

HYPOSMOTIC AGENTS

- PEG-3350 OR PEG-SD
 - Incorporated the use of low volume PEG preparation like MiraLax in combination with a commercially available sports drink.
 - NOT FDA APPROVED
 - Commonly used with bisacodyl

The Method

- MiraLax 238g (PEG 3350 powder) combined with 2 liters of Gatorade and bisacodyl tablets. MiraLax is hypotonic, not osmotically balanced and has not been evaluated in large safety studies so its use remains off-label

HYPEROSMOTIC AGENTS

- Oral Sodium Sulfate
- Magnesium Citrate
- Sodium Phosphate

Sodium Phosphate

- Purgative agent formally in aqueous form now only available in pill form.
- Action is based on the osmotic effect of sodium.
- Causes large amounts of water to be drawn into the bowel lumen which creates an increase in peristalsis that cleanses the colon.

- Advantages- requires smaller volume of medication with 64 ounces of clear liquid.
- Disadvantages- Large electrolyte and fluid shifts
- Can cause hyperphosphatemia induced renal failure
- The black box warning for this preparation is that it can cause acute phosphate nephropathy

CAN'T I TAKE PILLS?

- OsmoPrep replaced Visicol tablets(discontinued in 2012)
- OsmoPrep requires 20 tablets the evening prior to colonoscopy , and 12 tablets 3-5 hours prior to colonoscopy. They do not have a microcrystalline cellulose coating which can have a retained residue

COMPLICATIONS WITH SODIUM PHOSPHATE

- This prep has become less popular given the possible adverse event of phosphate nephropathy.
- Do not use in patients with renal insufficiency, taking NSAIDs, angiotensin converting enzyme inhibitors or angiotensin receptor blockers.
- The high sodium content makes sodium phosphate inappropriate for patients with CHF or advanced liver disease.

THE AGA RECOMMENDS

- Avoid using sodium phosphate in elderly patients, patients with known IBD, patients with CHF, kidney, and liver disease

LAXATIVES

- Bisacodyl- Stimulant laxative to enhance motility, used with other purgatives (Halflytely and MiraLax)
- Senna-stimulant laxative, activated by colonic bacteria to increase colonic motility. Not widely used due to poor tolerance related to abdominal cramps that can occur

THE SPLIT



SPLIT DOSE PREPS

- Suclear – PEG-ELS used with oral sodium sulfate
- Suprep - Sodium sulfate, potassium sulfate and magnesium sulfate
- Prepopik – Sodium picosulfate, magnesium oxide, anhydrous citric acid

These preps are low volume split dose followed by large amounts of water

SU PREP

- Hyperosmotic
- Combination of Sodium Sulfate, Potassium Sulfate, and Magnesium Sulfate
- NOT associated with electrolyte shifts

SU CLEAR

- Sodium Sulfate, Potassium Sulfate, Magnesium Sulfate and PEG-3350
- Prep split between OSS and PEG-ELS
- OSS first then PEG-ELS

PREPOPIK

- Prepopik- FDA approved for a low volume bowel preparation
- Has three active ingredients, sodium picosulfate, magnesium oxide and anhydrous citric acid.
- All combined provide a dual action of mechanism. Together they stimulate colonic peristalsis and react to create an osmotic effect that retains water in the bowel lumen.
- Prepopik is the lowest volume preparation commercially available in the US.

OVER THE COUNTER

- Magnesium Citrate
 - Hyperosmotic
 - May cause an increase in serum magnesium levels
 - Magnesium toxicity can result in bradycardia, hypotension, nausea, and drowsiness
 - Not FDA approved for colon prep

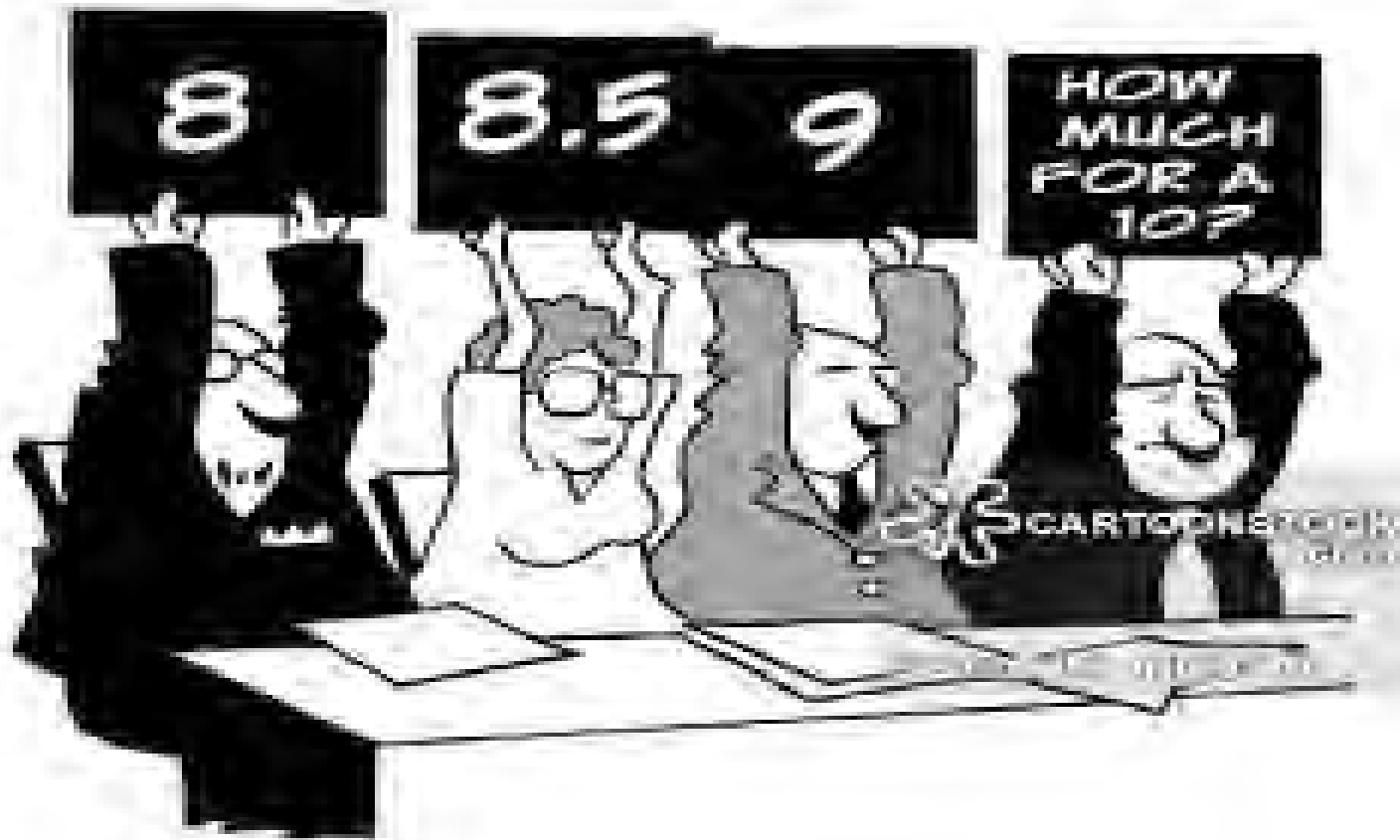
The Cost Comparison

| Colon Preparation | Trade Name | Average Wholesale Cost in Dollars |
|--|-------------------|-----------------------------------|
| PEG-ELS | GoLYTELY | \$24.56 |
| SF-PEG-ELS | NuLYTELY, Trilyte | \$26.89, 27.98 |
| Low Volume PEG-ELS with Ascorbic Acid | Movi Prep | \$81.17 |
| Low Volume PEG-3350-SD | Miralax | \$10.08 |
| Oral Sodium Sulfate | Su Prep | \$91.96 |
| Oral Sodium Sulfate with PEG-ELS | Su Clear | \$77.94 |
| Sodium picosulfate/magnesium oxide/anhydrous citric acid | Prepopik | \$95.34 |
| Magnesium Citrate | OTC | \$2.48 |
| Sodium Phosphate tabs | Osmoprep | \$150.84 |

WHAT'S THE SCORE

THREE BOWEL PREPARATION SCALES

- ❖ Aronchick Scale
- ❖ Ottawa Bowel Prep Scale
- ❖ Boston Bowel Preparation Scale



ARONCHICK SCALE

| | |
|----------|--|
| 5 | Inadequate-Repeat preparation needed |
| 4 | Poor-Semi solid stool that could not be suctioned & <90% of colon seen |
| 3 | Fair-Semi solid stool that could not be suctioned but >90% of colon seen |
| 2 | Good-Clear liquid covering up to 25% of mucosa, but >90% of colon seen |
| 1 | Excellent->90% of colon seen |

OTTAWA BOWEL PREP SCALE

| | |
|----------|---|
| 4 | Inadequate-Solid stool not cleared with washing and suctioning |
| 3 | Poor-Necessary to suction liquid to adequately view segment |
| 2 | Fair-Necessary to suction liquid to adequately view segment |
| 1 | Good-Minimal turbid fluid in segment |
| 0 | Excellent-Mucosal detail clearly visible |

OTTAWA BOWEL PREP FLUID SCALE

Rating for the amount of fluid in whole colon

| | |
|----------|------------------------------|
| 2 | Large amount of fluid |
| 1 | Moderate amount of fluid |
| 0 | Small amount of fluid |

BOSTON BOWEL PREPARATION SCALE

| | |
|----------|---|
| 0 | Unprepared colon with stool that cannot be cleared |
| 1 | Portion of mucosa in segment seen after cleaning, but other areas not seen because of retained material |
| 2 | Minor residual material after cleaning, but mucosa of segment generally well seen |
| 3 | Entire mucosa of segment well seen after cleaning |

THE RESULTS

Example of Excellent Prep



Example of Poor Prep



Poor Bowel Preparation Attribution Factors

- Inpatient status
- Chronic constipation
- Tricyclic antidepressants and/or Opioid dependence
- Males
- Procedure scheduled later in the day
- Low socioeconomic status
- Increased body mass index and/or abdominal girth
- Noncompliance due to complex prep instructions

EDUCATION

How do we get the word out about proper prepping?

- Videos
- Pamphlets
- Pre op Phone calls

- One study conducted by SR Prakish, S Verma, J McGowan, et al. compared the quality of bowel preparation using the Ottawa Bowel Preparation Quality scale after patients viewed a supplemental educational video to assist with the bowel preparation

What they found

- 133 patients were enrolled in the study. 67 were assigned the instructional video. 79% were satisfied on a 1-5 scale with the video.
- 32 patients viewed the video only once.
- 26 viewed the video twice.
- 6 viewed it three times 3 watched it > than three times.
- 95% reported they would recommend the video to someone receiving a colonoscopy. 64% reported they learned additional information

Conclusion: Patient's who viewed the supplemental video had significantly improved colonic preparation quality as measured using the Ottawa scale

HELLO HELLO

- Another option is telephone based pre-education the day before the scheduled colonoscopy.
- A telephone call pre –procedure is a reasonable alternative for reminding patients how to prepare for their colonoscopy

CAN YOU READ?

- Development of an educational booklet:
- Emphasizes importance of patient participation in having a successful colonoscopy. Provides risk information, colon cancer awareness by having a screening colonoscopy.
- Inclusion of daily preparatory instructions in a step by step fashion.
- Pictures of allowable and prohibited foods.
- Description of clear liquids
- A guide to interpret the effectiveness of their bowel prep by using a simple visual color and transparency scale for stool returns.
- An interactive colonoscopy check list of sequential steps to follow prior to a colonoscopy. Use of cartoons have proven to improve bowel preparations

THE TAKE AWAY

- **ISO-OSMOTIC LAVAGE SOLUTIONS**
 - SAFER TO USE IN PATIENTS WITH COMORBIDITIES
- **HYPERTONIC SOLUTIONS**
 - MAY CAUSE ELECTROLYTE IMBALANCES
 - MAY LEAD TO KIDNEY DAMAGE

- Patient education is one of the most important components of patient prep
- Whether video, phone calls or pamphlets are used, educating patients about the importance of a proper prep created increased dividends on colonoscopy

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