

Bowel Preparation for Colonoscopy:

Maximizing Efficacy, Minimizing Risk

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The success of colonoscopy as a screening modality for colorectal cancer is highly dependent upon the ability to purge the colon of fecal material in order to provide an unobscured view of the bowel wall. Inadequate cleansing of the colon, reported to occur in about 27% of all examinations, results in missed adenomas.¹

Furthermore, suboptimal bowel preparation leads to prolonged procedure times, lower rates of cecal intubation, reduced screening intervals, higher screening costs, and possibly, an increased risk for procedure-related complications. Consequently, the adoption of more effective methods of bowel cleansing and a greater emphasis on patient compliance with preparation instructions will improve the effectiveness and efficiency of colonoscopy, as well as minimize the risk for procedural complications.

Bowel Preparations

The available purgatives for colonoscopy can be classified into 1 of 3 categories: osmotic agents, polyethylene glycol-based (PEG) solutions, and stimulants. Osmotic laxatives increase intraluminal water by promoting the passage of extracellular fluid across the bowel wall. Examples of osmotic preparations include sodium phosphate (NaP), magnesium citrate, and mannitol. The PEG-based solutions consist of a high molecular weight nonabsorbable polymer in a dilute electrolyte solution. PEG solutions are designed to be osmotically balanced, limiting the exchange of fluid and electrolytes across the colonic membrane. Stimulant laxatives work by increasing smooth muscle activity within the wall of the colon. Examples of stimulant purgatives include senna, bisacodyl, and sodium picosulfate. Dietary modification, consisting of a clear liquid or a low fiber diet for 24 hours prior to the procedure, is

usually combined with a purgative regimen. This section provides a brief overview of the available purgatives for bowel preparation (Table). Several comprehensive reviews on the comparative efficacy, safety, and tolerability of these agents have recently been published, and readers wanting a more in-depth analysis of this subject are referred to these sources.²⁻⁴

POLYETHYLENE GLYCOL

A variety of PEG-based lavage regimens are currently available for bowel cleansing prior to colonoscopy. These preparations differ with respect to volume of lavage solution, electrolyte content, molecular weight of the polymer, requirement for an adjunctive laxative, and the presence of artificial sweeteners. Commercially available PEG lavage solutions include the traditional 4-L preparations (GoLYTELY [Braintree], Colyte [Schwarz Pharma], NuLYTELY [Braintree], TriLyte [Schwarz Pharma]), and low-volume 2-L regimens (HalfLyte [Braintree], MiraLAX [Schering-Plough]) that require the addition of bisacodyl or magnesium citrate. The recommended dosing of most PEG solutions is 240 mL (8 oz) every 10 minutes. A “split-dose” regimen—in which part of the laxative is taken the evening before, and the remainder is taken the morning of the procedure—has been demonstrated to be more effective and better tolerated than a single dose taken the evening before the procedure (see below). It is estimated that 5% to 38% of patients are unable to complete the 4-L PEG preparation because of volume-related symptoms of abdominal fullness, nausea, or vomiting.⁴ Low-volume PEG preparations were developed in an effort to improve patient tolerance for the lavage regimen.

The low-volume PEG products are generally associated with less abdominal discomfort, nausea, and vomiting than the 4-L preparations, yet with equivalent efficacy.⁴⁻⁵ At the current time, most low-volume PEG preparations require the addition of adjunctive stimulant laxative. Patients ingest 4 bisacodyl delayed-release tablets (20 mg) at approximately 12 noon the day before the procedure, and start the lavage solution following evacuation or no more than 6 hours later. A low-volume PEG preparation has recently been introduced that does not require the addition of a laxative (MoviPrep, Salix). In addition to PEG-3350 and sodium sulfate, it contains ascorbic acid which serves as an osmotic agent to enhance bowel cleansing. A multicenter, randomized, single-blind study found MoviPrep to be as effective as 4 L PEG.⁶ In another comparative study, MoviPrep and an oral NaP-based preparation produced comparable results in overall colon cleansing and patient satisfaction.⁷

Overall, the safety record with PEG-based preparations has been excellent. During the 6-year period ending in 2002, the FDA received 100 reports of adverse events with PEG solutions, including 30 serious and 6 fatal events.⁴ Complications of PEG preparations include hypothermia, hyponatremia, intestinal perforation, aspiration, and Mallory-Weiss tear.⁸ The use of PEG-based bowel cleansing is contraindicated in patients with

gastric outlet obstruction, high-grade small bowel obstruction, and suspected bowel perforation.

ORAL SODIUM PHOSPHATE

Oral NaP solution (Fleet Phospho-soda Oral Saline Laxative, CB Fleet) contains monobasic and dibasic sodium phosphate, and is usually administered as 2, 45-mL doses 10 to 12 hours apart. Patients are instructed to consume significant quantities of liquid (64 oz) during the preparation in order to prevent dehydration and electrolyte disturbances. The mean onset and duration of bowel activity following ingestion of the first dose is 1.7 and 4.6 hours, respectively.⁹ It is recommended that NaP not be used in patients with impaired renal function (creatinine clearance <60 mL/min), congestive heart failure, or hypercalcemia. In addition, caution is advised when using NaP in individuals with pre-existing dehydration, electrolyte disturbances, or an inability to consume an appropriate quantity of fluids. Patients using NaP preparations should be carefully instructed to maintain adequate fluid intake throughout the bowel cleansing process and to not exceed the recommended dose of NaP.

A tablet formulation of NaP, designed to improve patient tolerability, was approved by the FDA in 2000. Visicol (Salix), the initial formulation, was recommended at a dose of 48 to 60 g, or 28 to 40 tablets split between 2 doses. Due to the presence of insoluble microcrystalline cellulose—an insoluble excipient within the NaP tablet that obscured visualization of colonic mucosa, in some instances—a residue-free NaP tablet was developed. OsmoPrep (Salix) is smaller and has a smooth waxy surface that improves its ease of swallowing. The recommended dosage is 32 tablets—20 tablets the evening before and 12 tablets 3 to 5 hours prior to examination. Compared with Visicol, OsmoPrep induced less pronounced changes in electrolyte levels and fewer adverse events, including abdominal distention, nausea, pain, and vomiting.¹⁰

At least 16 studies have compared the efficacy and tolerability of PEG with NaP.⁴ Overall, these trials demonstrated that NaP is more effective than either the 2-L or 4-L PEG-based preparations. In most of these studies, patient tolerance and compliance with bowel preparations was also superior with NaP. These conclusions are supported by the findings of two meta-analyses and an evidence-based position statement prepared by the Canadian Association of Gastroenterology.²⁻⁴

The use of NaP is often associated with abnormalities in serum electrolytes, including hypernatremia, hypokalemia, hypocalcemia, and hyperphosphatemia. Although these alterations are usually transient and clinically asymptomatic, the FDA received 34 reports of adverse events between 1997 and 2002, including 18 serious events and 8 fatalities related to the use of NaP preparations.⁴ A recent study reported 21 cases of acute phosphate nephropathy, all occurring in patients that had recently taken a NaP bowel preparation.¹¹ Seventeen patients (81%) were female, the mean age among

Table. Commonly Used Purgatives for Colonoscopy Preparation

Class	Product	Recommended Usage*
Sodium Phosphate		
Aqueous	Fleet Phospho-soda Oral Saline Laxative (CB Fleet)	45 mL at 5 to 6 pm the evening before colonoscopy; 45 mL 10 to 12 h later (at least 3 h before the procedure)
	Fleet Phospho-soda EZ-Prep (CB Fleet)	45 mL at 5 to 6 pm the evening before colonoscopy; 30 mL 10 to 12 h later (at least 3 h before the procedure)
Tablet	Visicol Tablets (Salix)	20 tablets (3 tablets every 15 min) at 5 to 6 pm the evening before colonoscopy; repeat with 12 to 20 tablets 10 to 12 h later (at least 3 h before the procedure)
	OsmoPrep Tablets (Salix)	20 tablets (4 tablets every 15 min) at 5 to 6 pm the evening before colonoscopy; repeat with 12 tablets 10 to 12 h later (at least 3 h before the procedure)
Polyethylene glycol		
4-L PEG-ELS	GoLYTELY (Braintree)	240 mL (8 oz) every 10 min beginning at 5 to 6 pm the evening before colonoscopy (total, 3 L); remaining 1 L 10 to 12 h later (at least 3 h before the procedure)
	Colyte (Schwarz Pharma)	same as above
4-L SF-PEG	NuLYTELY (Braintree)	same as above
	TriLyte (Schwarz Pharma)	same as above
2-L PEG-ELS and bisacodyl delayed-release tablets	HalfLyte (Braintree)	4 bisacodyl delayed-release tablets at 12 noon the day before colonoscopy; 240 mL (8 oz) every 10 min beginning at 5 to 6 pm (total, 1 L); repeat 240 mL (8 oz) every 10 min beginning 3 to 4 h before the procedure (total, 1L)
2-L PEG and bisacodyl delayed-release tablets	MiraLAX (Schering-Plough)	same as above
2-L PEG with ascorbate	MoviPrep (Salix)	240 mL (8 oz) every 15 min beginning at 5 to 6 pm the evening before colonoscopy (total, 1 L), followed by at least 16 oz fluid; 240 mL (8 oz) every 15 min at least 3 to 4 h before the procedure (total, 1L), followed by 16 oz fluid
Magnesium citrate		
	LoSo Prep (E-Z-EM)	magnesium citrate (pre-measured quantity) at 5 to 6 pm the evening before colonoscopy; 4 bisacodyl delayed-release tablets at 7 to 8 pm (2 h after magnesium citrate); bisacodyl suppository 2 to 3 h before the procedure

ELS, electrolyte lavage solution; h, hours; L, liters; min, minutes; mL, milliliters; oz, ounces; PEG, polyethylene glycol; SF, sulfate-free

* In some cases, these recommendations do not correspond with the FDA-approved dosage.

patients was 64 years, 16 of the 21 (76%) had a history of hypertension, and 14 (67%) were taking an angiotensin-converting enzyme inhibitor or angiotensin receptor blocker. Although the exact incidence of this complication cannot accurately be quantified, the risk appears to be quite low considering the relatively small number of cases reported and the extraordinarily large number of exposures to NaP (estimated to be in excess of 5,000,000 per year).¹² On the basis of its overall safety and efficacy, NaP is an appropriate option for bowel preparation in healthy individuals not possessing one of the contraindications discussed above.

MAGNESIUM CITRATE

Magnesium citrate is a hyperosmotic saline laxative that increases intraluminal fluid volume, and, via stimulation of cholecystokinin release, enhances gut motility. It is administered as a split dose, 300 mL (10 oz) the evening before colonoscopy and 3 to 5 hours prior to the procedure. Since magnesium is eliminated by the kidneys, it should not be used in patients with renal disease or impaired renal function.

A prepackaged low-fiber diet (NutraPrep [E-Z-EM]) has recently been introduced, containing three low-residue meals and snacks. The product is intended for use in combination with a bowel cleansing system that contains a low-sodium magnesium citrate, bisacodyl-delayed release tablets, and a bisacodyl suppository (10 mg; LoSo Prep [E-Z-EM]). Patients are instructed to take magnesium citrate and 4 bisacodyl tablets (20 mg) the evening before colonoscopy plus a bisacodyl suppository on the morning of the procedure. A randomized, investigator-blinded study reported superior bowel cleansing and patient tolerability with this regimen compared with NaP.¹³

Clinical Considerations

An effective preparation for colonoscopy is one that consistently produces high quality bowel cleansing that is adequate for the detection of all adenomatous polyps. It must also be safe, and ideally, work quickly, without producing gastrointestinal distress. None of the products currently marketed for colonoscopy preparation meet all of these criteria. Although most are effective when properly administered, they require 12 to 24 hours for adequate bowel cleansing, and a significant proportion of patients experience disturbing gastrointestinal side effects. Consequently, the choice of a purgative regimen(s) and methods of administration vary considerably among endoscopists. This section examines strategies of colon cleansing and provides suggestions for improving the quality and safety of bowel preparation. Recommendations for colonoscopy preparation within special patient populations is also presented.

BOWEL PREPARATION: ONE SIZE DOES NOT FIT ALL

Some endoscopists prefer to offer all patients a single method of bowel preparation. The benefits of such an approach include simplicity and an economy of time,

eliminating the need to discuss with the patient more than one regimen of bowel cleansing. Among the disadvantages, however, is an inability to adjust for differences between patients. For example, individuals vary in their tolerance and reaction to purgatives.¹⁴ The same cathartic may be well tolerated by one patient but produce nausea, vomiting, and abdominal cramps in another. Some patients prefer NaP pills whereas others favor the solution. Individuals with chronic constipation may require a more rigorous bowel cleansing regimen for adequate bowel cleansing. Differences such as these are best accommodated by offering several bowel preparations, so that each patient can be matched with the preparation that is most likely to be effective, safe, and well tolerated.

When endoscopy is performed in an open access setting, it is necessary to prescreen patients before selecting a purgative regimen. In our practice, a receptionist or medical assistant completes a brief medical questionnaire for each patient at the time of scheduling. Information obtained that pertains to the choice of purgative regimen includes: 1) a list of current medications and drug/food allergies; 2) a history of heart failure, kidney disease, ascites, or fluid/electrolyte abnormalities; and 3) a history of chronic constipation or incomplete colonoscopy. Based upon the responses, a bowel cleansing regimen (NaP versus PEG) is then suggested. If oral NaP is chosen, patients are given the option of solution or pill formulation. When using a PEG-based regimen, the 2-L PEG preparation is chosen, except for use in patients with chronic constipation (see below). In this way, the method of bowel cleansing for colonoscopy is selected individually in order to maximize safety, efficacy, and patient satisfaction.

PATIENT EDUCATION

Many endoscopy centers utilize a patient education program when preparing patients for gastrointestinal endoscopy. The topics to be covered include a description of the procedure, possible adverse effects and complications, and preparation instruction. The impact of bowel preparation on the success of colonoscopy, and the importance of compliance with instructions should be emphasized. This message may be communicated through one-on-one sessions, group meetings, or self-instruction using either a videotape or computer-based program. Communicating this information effectively to the patient helps to alleviate fear and anxiety related to the procedure. In a prospective study, an education program reduced the rate of failed preparations among ambulatory patients from 26% to 5%.¹⁵ A role for educational intervention in hospitalized patients has not yet been established.¹⁶

THE ROLE OF HYDRATION

Colon cleansing produces significant volume loss through the gastrointestinal tract that can result in intravascular volume depletion. The fluid loss during bowel preparation may exceed 2 to 3 L, based upon an

assessment of hemodynamic parameters and indirect measures such as body weight, serum osmolality and hematocrit.¹⁷ Significant differences in fluid loss between NaP and PEG formulations have been reported in some studies.¹⁸⁻²¹ Decreases in systolic blood pressure (> 10 mm Hg from baseline) and/or postural tachycardia (\geq 10 beats/minute from baseline) have been described in 10% to 35% of patients who completed a bowel cleansing regimen.¹⁸ In addition, the use of NaP preparations is often associated with changes in serum electrolytes, including transient increases in phosphate and sodium, and reductions in calcium and potassium. These changes generally remain within the normal range and are clinically asymptomatic. Serious electrolyte disturbances, however, have been reported with both NaP²² and PEG.²³ Inadequate hydration is widely believed to play an important role in such complications. Therefore, adequate hydration during bowel preparation should be emphasized, particularly in high-risk individuals, such as the elderly, users of diuretics or other medications that alter electrolyte levels, and patients with preexisting electrolyte abnormalities. Patients should be advised to consume at least 64 oz (approximately 2 L) of clear fluid on the day prior to colonoscopy. The use of a carbohydrate-electrolyte solution (e.g. Gatorade) has been reported to improve patient hydration status, patient tolerance for the preparation, and the quality of bowel preparation.²⁴ Patients should also be reminded to continue hydration after colonoscopy; we advise that patients consume at least 32 oz (4, 8-oz glasses) during the 8 hours following completion of the procedure.²⁵

TIMING IS EVERYTHING

The quality of colon preparation—especially in the ascending colon—is closely related to the time between completion of the preparation and the examination.^{20,26} Despite diet restriction for 24 hours, optimal cleansing of the colon requires that at least part of the preparation be ingested within 6 to 8 hours of the examination. When more than 8 hours has elapsed, ileal contents begin to fill the colon, coating the wall of the ascending colon with a thin film of chyme that obscures mucosal detail (Figure 1).

Split-dose regimens improve the efficacy of both NaP and PEG preparations. In a study using 3-L PEG plus bisacodyl, a split-dose regimen (including 1 L on the day of procedure) gave a higher proportion of satisfactory preps (75% vs 66%) and better patient compliance with lower rates of discontinuation.²⁷ In another study, the quality of bowel prep was compared using 2-L PEG preparation administered either the day of (6 to 8 h before) or the evening before (13 to 16 h before) the procedure.²⁸ Colon preparation was better (93% vs 72%) and more lesions were detected (2.8 vs 1.9) in the group who received same-day bowel cleansing compared with the group who received cleansing the evening before examination, respectively. A randomized trial compared 2 dosing regimens of NaP, 1 consisting of 2, 45-mL doses taken the evening before (3 pm and 8 pm) and the other

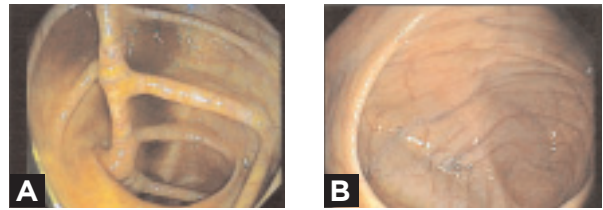


Figure 1. Images of the cecum during colonoscopy demonstrate incomplete versus complete bowel cleansing.

Image A demonstrates the cecum partially obscured by a thin layer of ileal fluid and chyme. In contrast, the cecum in image B is optimally prepared for careful inspection of the mucosa.

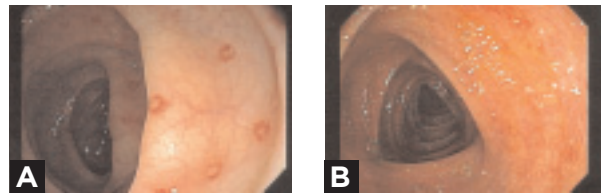


Figure 2. Typical images obtained during colonoscopy with successful bowel cleansing.

Image A shows multiple, punctate red spots with central clearing—a diagnostic artifact of bowel preparation. These changes are readily distinguishable from active colitis (B), which is characterized by a diffuse inflammatory process.

including 1 of the doses taken the morning of the procedure (8 pm and 6 am).²⁹ Patients who received part of their preparation on the same day had better scores for quality of cleansing than those who underwent preparation on the previous day (global rating good/excellent, 80% vs 68%, respectively). These and other studies provide convincing evidence that a split-dose regimen, including 1 dose of laxative within 6 to 8 hours of examination, improves cleansing and imaging of the mucosa, especially within the right colon where flat polyps are more often encountered.

For the purpose of studying the success of bowel preparation, it is helpful to distinguish patients that are scheduled for morning versus afternoon procedures. Patients undergoing a morning procedure should ingest the first dose of cathartic between 4 and 6 pm and the remainder between 3 and 5 am (depending on the time of the procedure and the laxative selected). Patients scheduled for afternoon procedures take their first dose at 6 to 7 pm and the second dose at 6 to 7 am. Some endoscopy units have modified their endoscopy schedule, booking all colonoscopies beginning at 12 noon. This affords patients the convenience of taking the second dose of laxative at 6 to 7 am, rather than waking at 3 to 5 am. However, a recent study comparing the outcomes

of morning versus afternoon colonoscopies reported significantly higher rates of incomplete procedures and lower rates of adequate bowel preparations in the afternoon.³⁰ In our experience, many patients prefer to undergo colonoscopy in the morning, and most do not object to waking during the night to complete the cleansing regimen.

In Japan, the concept of split dosing has been taken one step further with colon cleansing performed entirely on the morning of examination.³¹ Little or no diet modification is required the day prior to colonoscopy. Patients are instructed to begin the preparation around 6 am with 2-3 L PEG. The preparation is considered complete, usually within 3 hours, when the rectal effluent is clear. Anecdotally, this preparation is reported to produce excellent cleansing. It remains to be established whether a similar method of preparation would be effective and tolerated by Western patients.

In some instances, the timing of bowel preparation may need to be altered in order to accommodate the fasting requirements related to procedural sedation. There are no universally accepted guidelines on preprocedural fasting, and consequently, the literature contains a variety of recommendations on this subject. Guidelines published by the American Society of Anesthesiology state that patients should fast for a minimum of 2 hours for clear liquids and 6 hours for light meal prior to sedation.³² On the other hand, an evidence-based review by American College of Emergency Physicians³³ states that “recent food intake is not a contraindication for administering procedural sedation and analgesia, but should be considered in choosing the timing and target level of sedation.” A recent position statement from the American Gastroenterological Association³⁴ concluded that “there is inadequate evidence to permit the development of absolute requirements for preprocedural fasting, and the clinician should be guided by the practice parameters provided by various professional societies.” At the current time, until definitive evidence-based guidance is available, it is reasonable to recommend that patients undergoing colonoscopy with sedation remain fasting for a minimum of 2 hours before the procedure. This requirement does not necessitate a change in the use of a split-dose regimen for bowel preparation.

SPECIAL PATIENT SUBPOPULATIONS

Elderly Patients. Persons 65 years and older comprise at least 20% of the patient population undergoing routine colonoscopy. Older individuals are more likely to have an incomplete preparation.^{1,35} The reasons for this are multifactorial and include an increased likelihood for constipation, reduced mobility, and difficulty completing the preparation. Elderly patients using NaP are also more likely to manifest hyperphosphatemia as a result of impaired renal function, co-morbid illness, and concomitant medications.²⁰

The efficacy, safety, and tolerability of various purgatives in older individuals have been evaluated in several

studies. A randomized controlled trial in octogenarians compared NaP with a 4-L PEG preparation.³⁵ The quality of preparation was similar in both groups, with a good or excellent rating in 77% to 81% of patients receiving NaP or PEG. As anticipated, PEG produced less change than NaP in the clinical parameters of dehydration and laboratory tests. Fewer patients were unable to complete the NaP preparation compared with the PEG preparation, although the difference did not reach statistical significance. Overall, patients preferred NaP to PEG and were more willing to repeat this preparation again in the future. A second study, comparing NaP with PEG in elderly patients reported that the overall quality of colon cleansing was comparable for both preparations.³⁶ Furthermore, patients who received NaP tolerated their preparation better than those who received PEG, although the difference was not statistically significant.

Patients With Inflammatory Bowel Disease. In general, patients with inflammatory bowel disease can prepare for colonoscopy using any of the standard bowel purgatives. One exception is the patient with moderate to severe diarrhea (more than 6 to 8 bowel movements per day); for this patient, the dose of cathartic may be reduced or eliminated altogether. NaP preparations can produce aphthoid lesions in the colon, most prominently within the rectum and sigmoid. This endoscopic appearance is distinct and can be readily distinguished from the endoscopic appearances of Crohn’s and ulcerative colitis (Figure 2).

Pediatric Patients. In older children (12 years and older), oral NaP solution at a dosage of 45 mL x 2 is probably the most widely used preparation.⁵ When used for younger children (6 to 11 years), the dose is often reduced to 30 mL x 2. NaP is not recommended for children ages 5 years and younger. A second method of preparation for children is a PEG-based formulation (MiraLAX) administered at a dose of 1.25-1.5 g/kg daily for 4 days. In some instances, a laxative, such as bisacodyl, may be added to the regimen 1 day prior to colonoscopy. The least commonly used preparation consists of either saline or phosphate enemas in combination with a senna laxative.⁵

In the pediatric population, there are inadequate data assessing efficacy and safety to recommend 1 regimen over another. The PEG-based preparations are generally effective, but are often accompanied by abdominal bloating and vomiting.³⁷ A modified PEG preparation that is administered over 4 days appears to be better tolerated, but has the potential for disrupting a child’s ability to attend school and participate in other activities.³⁸ Generally, oral NaP is better tolerated by children than PEG, although hyperphosphatemia is often observed. Practice recommendations for bowel preparation in children undergoing colonoscopy vary. A recent consensus statement prepared by a joint task force within the United States⁵ concluded that NaP, PEG, and phosphate enema/senna preparations were all “safe and will adequately prepare the child’s colon for

colonoscopy.” The authors caution, however, that “in certain circumstances, such as bowel preparation in children, ... it may be advisable to adhere to PEG-based solutions because of the risks for occult physiologic disturbances that may potentially contraindicate the use of NaP-based regimens.” For example, the FDA-approved package insert of one manufacturer of NaP (CB Fleet), cautions against the use of oral NaP “in children under the age of 18 years.” Regardless of the regimen selected, it is important to provide children with adequate hydration during the process of bowel preparation. A carbohydrate-electrolyte solution designed specifically for children is often helpful for this purpose.

Patients With Lower Gastrointestinal Bleeding. In most circumstances, patients undergoing colonoscopy for hematochezia must be prepared quickly.³⁹ Colon transit is hastened by the presence of blood, and in most cases, bowel cleansing can be completed within 2 to 3 hours using 0.5 to 2 L of PEG solution. Patients who are unresponsive or mechanically ventilated may receive the PEG solution through a nasogastric tube.

Patients With a History of Inadequate Preparation or Chronic Constipation. There are no studies to provide the clinician with guidance for preparation of the patient with chronic constipation or a history of inadequate bowel cleansing during a previous colonoscopy. Measures that have been recommended include: 1) extending the period of diet modification from 24 hours to 48 hours; 2) adding oral bisacodyl or senna to a PEG or NaP regimen; and 3) increasing the total volume of PEG from 4 L to 6 L, with administration split over 48 hours (usually 1 to 2 L on day 1, and 3 to 4 L on day 2). In addition, adequate hydration will help to improve the adequacy of cleansing.

Conclusion

A substantial number of colonoscopies are suboptimal because of inadequate bowel preparation. This figure ranges from 17% to 30% in randomized trials and is probably higher in clinical practice. Several patient characteristics have been associated with poor bowel preparation, including history of constipation, inpatient status, use of antidepressants, and noncompliance with bowel preparation instructions.^{40,41} An awareness of these factors, combined with strategies designed to optimize the results of purgative regimens and an emphasis on patient education and compliance, will maximize the efficiency of colonoscopy and minimize its risks (Box).

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Box. Key Points

1. The choice of bowel cleansing regimen for colonoscopy should be based upon the patient's age, health status, comorbid diseases, and personal preference.
2. A split dose bowel cleansing regimen that includes 1 dose of laxative within 6 to 8 hours of the examination improves the quality of bowel cleansing, especially within the ascending colon.
3. Sodium phosphate (NaP) regimens have demonstrated superior efficacy and tolerability to polyethylene glycol (PEG)-based preparations for colonoscopy preparation. NaP is an acceptable purgative for bowel cleansing in suitable patients; however, its use should be avoided in patients with impaired renal function, congestive heart failure, advanced liver disease, and hypercalcemia.
4. All purgatives have been associated with serious adverse events. The risk for complications can be minimized by selecting the most appropriate bowel cleansing regimen for each patient and highlighting the importance of adherence to preparation instructions.
5. The importance of adequate hydration during and after bowel preparation should be emphasized for patients undergoing colonoscopy.

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DISCLAIMER—This review is designed to be a summary of information, and represents the opinions of the author. Although detailed, the review is not exhaustive. Readers are strongly urged to consult any relevant primary literature, the complete prescribing information available in the package insert of each drug, and the appropriate clinical protocols. No liability will be assumed for the use of this review, and the absence of typographical errors is not guaranteed. Copyright © 2007, McMahon Publishing, 545 West 45th Street, 8th Floor, New York, NY 10036. Printed in the USA. All rights reserved, including right of reproduction, in whole or in part, in any form.

Patient Guide to PREPARING FOR COLONOSCOPY



Preparing for colonoscopy involves cleaning your bowel completely so that your physician has a clear view during the exam. This process is very important because if everything has not been removed from your intestines, the procedure could take longer, there is a greater risk for complications, the physician may not be able to finish the colonoscopy properly, and you might have to do it all over again sooner than normal. To ensure that your colonoscopy is completed properly, follow all your doctor’s instructions.

Helpful Tips

- ❖ Drink plenty of clear, nonalcoholic fluids, especially sports drinks
- ❖ Avoid red liquids or foods, as they can look like blood in the colon
- ❖ Prepare to spend most of the day before your test on or near the toilet
- ❖ Use adult wet wipes or a water spray to clean off instead of toilet paper
- ❖ Call the doctor’s office for any help with the preparation or instructions

Q & A

How do I cleanse my colon?

There are different methods to clean out your colon, and your doctor will tailor one for you that he or she has found works. To make sure you and your doctor choose the right method for you, tell your doctor of your current medications, any drug or food allergies, and if you have ever had heart problems, kidney disease, ascites, fluid or electrolyte abnormalities, chronic constipation, or an incomplete colonoscopy. Remember to follow your doctor’s instructions exactly so your procedure is completed as smoothly as possible.

Why do I have to drink so much fluid for the colonoscopy?

You may be given liquid electrolytes or something similar to drink before your colonoscopy. It will be a lot to drink and it may not taste very good; but, it is important to drink the entire preparation to thoroughly clean your colon, avoiding any problems during the procedure and making sure you do not have to do it again any time soon.

Why do I have to eat and drink differently?

Your doctor may give you a list of low-fiber foods to eat for one to three days before your colonoscopy. Make sure to stick to eating foods on this list as much as possible. Your doctor will also ask you not to eat anything after a certain time before your test and to drink plenty of clear, nonalcoholic fluids. Doing so will make cleaning your colon more complete, as well as keep you hydrated and safe from any problems with the preparation for the colonoscopy and the colonoscopy itself.

RESOURCES

Mayo Clinic
www.mayoclinic.com/health/colonoscopy/CO00009

Centers for Disease Control and Prevention
www.cdc.gov/cancer/colorectal/basic_info/screening

American Gastroenterological Association
www.gastro.org/wmspage.cfm?parm1=861

From the office of _____

Directions/comments _____
