

Colonoscopy 'my way': Preparation, anticoagulants, antibiotics and sedation

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JD Wayne. Colonoscopy 'my way': Preparation, anticoagulants, antibiotics and sedation. Can J Gastroenterol 1999;13(6): 473-476. Colonoscopy was introduced in the 1960s. The facility with which this technique is performed has been enhanced by vast improvements in instrumentation. In spite of this, physician attitudes concerning colonoscopy have changed little over the past several decades. The diet for precolonoscopic preparation has not been altered for 30 years. Colonoscopists have a great reluctance to use a new preparation instead of the 4 L electrolyte solution, perhaps because this was such a significant advance in colonoscopic cleansing, its predecessor being castor oil and enemas. Physicians continue to be wary of the patient who is taking acetylsalicylic acid in the absence of any studies that show that this is detrimental for polypectomy. The management of the patient on warfarin anticoagulation remains a subject for debate. As for antibiotic prophylaxis, most endoscopy units do not have a standardized approach, although there are good guidelines that, if followed, should decrease the risk of infective endocarditis. Sedation for the endoscopic examination is usually administered by the colonoscopist, although anesthesiologists may, in some countries (and in some defined areas of the United States) be the primary administrators of sedation and analgesia. The present article is a personal approach to the following issues: the preparation of the colon for an examination, current thoughts about anticoagulation and acetylsalicylic acid, antibiotic prophylaxis for colonoscopy and the technique for sedation out of the hospital.

Key Words: *Antibiotics; Anticoagulants; Colonoscopy; Endoscopy*

La colonoscopie « à ma façon » : Préparation, anticoagulants, antibiotiques et sédation

RÉSUMÉ : La colonoscopie a fait son apparition au cours des années 1960. La facilité avec laquelle cette technique s'effectue a été améliorée par les importants perfectionnements apportés aux instruments. Malgré cela, les attitudes des médecins au sujet de la colonoscopie ont peu changé au cours des dernières décennies. En effet, la diète de préparation à la colonoscopie n'a pas évolué depuis 30 ans, les colonoscopistes sont très réticents à utiliser une nouvelle préparation plutôt que la solution d'électrolytes de 4 L, peut-être parce qu'elle a constitué un tel progrès pour le nettoyage colonoscopique, ses prédécesseurs ayant été l'huile de ricin et les lavements. Les médecins continuent de s'inquiéter des patients qui prennent de l'acide acétylsalicylique en l'absence de la moindre étude qui démontre ses effets nocifs lors de la polypectomie. La gestion des patients sous warfarine continue de faire l'objet de débats. Pour ce qui est de l'antibioprophylaxie, la plupart des unités d'endoscopie ne disposent d'aucune approche uniformisée, alors que, selon des directives valides, cette intervention pourrait réduire le risque d'endocardite infectieuse. La sédation pour l'examen endoscopique est habituellement administrée par le colonoscopiste, bien que les anesthésistes puissent dans certains pays (et dans certaines régions des États-Unis) être le principal intervenant à administrer la sédation et l'analgésie. Le présent article résume une approche personnelle, face aux enjeux suivants : la préparation du côlon en vue de l'examen, le point sur l'anticoagulothérapie et l'acide acétylsalicylique, l'antibioprophylaxie pour la colonoscopie et la technique de sédation à l'extérieur du contexte hospitalier.

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I personally perform about 2500 colonoscopies annually in my office, which is remote from the hospital. I have two fully equipped endoscopy rooms and four recovery rooms. I also perform upper gastrointestinal endoscopy at a ratio of about 20:1. The present article outlines my approach to the preparation of the colon for examination, current thoughts about anticoagulation and acetylsalicylic acid (ASA), antibiotic prophylaxis for colonoscopy and the technique for sedation in an out-of-hospital situation.

PREPARATION

Several studies have compared oral sodium phosphate preparation with a polyethylene glycol colonic lavage. Although some authors state that there is no difference (1,2) in colonic cleanliness, most state that the phospho-soda group has better colon cleansing than the polyethylene glycol group (3-5). Most patients who were prepared with both regimens preferred the phospho-soda because of the small volume compared with the 4 L of fluid that must be ingested with the electrolyte preparation (1-5). My own experience is that the sodium phosphate preparation is better tolerated by patients and provides better colon cleaning than does the large volume of electrolyte preparation.

The timing of the doses is quite important. My personal preference is for a patient to be on a full liquid diet the day before the examination. They may take ice cream, yogurt, milkshakes, etc. The night before the examination, at approximately 17:00 to 18:00, the patient takes 45 mL of sodium phosphate with water or juice, and this is repeated 4 h before the examination on the day of the colonoscopy. The second dose is very important because without it the bowel is always poorly prepared. We performed a study (6) entitled "Sodium phosphate preparation for colonoscopy: onset and duration of bowel activity", where 200 patients who took the sodium phosphate preparation supplied information on the timing and duration of bowel activity. Bowel activity began 1.6 ± 1.5 h after the first dose and continued for 5.1 ± 2.7 h. The second dose acted much quicker, and the time to onset

was 0.7 ± 0.4 h. Bowel activity continued for 3.1 ± 1.1 h. Therefore, if a patient has a long commute from their home to the site of endoscopy, they should allow 5 h for bowel evacuation after the second dose and take that dose accordingly. It should be noted that the time to bowel activity for the second dose is much faster than the first dose, which may not begin for 3 h and may last for up to 8 h.

It is important to screen patients before giving the phospho-soda preparation. Patients with renal disease or an elevated creatinine should not be given phospho-soda, nor should those who have heart, kidney or liver failure. Sodium phosphate at the recommended dosage causes significant alterations in serum sodium, potassium, chloride, calcium, ionized calcium and phosphorous levels (7). However, the vast majority of patients are able to take the preparation without any problem.

ANTICOAGULANTS

Patients who are to go undergo colonoscopic examinations for surveillance purposes without known colon polyps may have colonoscopy performed while on a therapeutic dose of warfarin (Coumadin, DuPont Pharma, Wilmington, Delaware). If a polyp is found on the initial examination, a decision can then be made as to whether the patient should be scheduled early on for a repeat colonoscopy when they are off anticoagulation therapy or, if a polyp is seen that is relatively small, the decision may be made to wait one, two or three years for repeat colonoscopic examination to assess the growth of the polyp. However, if therapeutic colonoscopy is the goal, the American Society for Gastrointestinal Endoscopy has recently issued guidelines (8) for patients on anticoagulants, ASA or other nonsteroidal anti-inflammatory drugs who are undergoing high risk procedures (Tables 1,2,3).

My personal preference is to request that patients on ASA discontinue taking ASA-containing compounds for one week before endoscopic examinations. If patients forget or are not informed and take ASA up until the time of

TABLE 1
Management of warfarin anticoagulation therapy for gastrointestinal endoscopic procedures

Procedure risk for bleeding	Condition risk for thromboembolism	
	High	Low
High	Discontinue warfarin 3-5 days before procedure. Consider heparin while INR is below therapeutic level	Discontinue warfarin 3-5 days before procedure. Re-institute warfarin after procedure
Low	No change in anticoagulation. Elective procedures should be delayed while INR is in supratherapeutic range	

INR International normalized ratio

TABLE 2
Procedure risk: High and low risk procedures for bleeding

High risk	Low Risk
Polypectomy	Diagnostic
Biliary sphincterotomy	Esophagogastroduodenoscopy with or without biopsy
Pneumatic or bougie dilation	Flexible sigmoidoscopy with or without biopsy
Percutaneous endoscopic gastrostomy	Colonoscopy with or without biopsy
Endosonographic guided fine needle aspiration	Endoscopic retrograde cholangiopancreatography
Laser ablation and coagulation	Biliary/pancreatic stent without sphincterotomy
	Endosonography
	Push enteroscopy

colonoscopic polypectomy, I inform them that there may be a slightly increased risk of bleeding postpolypectomy but that we will perform the procedure anyway. I do not cancel or postpone the elective procedure. Following endoscopy, I suggest that ASA be discontinued for seven to 10 days. If patients are on anticoagulation (warfarin) and they have low risk conditions for thromboembolism, I suggest, after consulting with their primary physician, that anticoagulation be discontinued for three to five days before colonoscopic polypectomy. I do not usually draw another prothrombin time or request an international normalized ratio (INR) before the colonoscopy. If patients have high risk conditions (Table 3), I suggest that they discontinue their anticoagulation on Saturday in order to be admitted to the hospital on Sunday, where heparin is started. The heparin is continued through Wednesday morning, when it is discontinued 4 h before the endoscopic examination. Four hours after colonoscopy and polypectomy, the heparin is reinstated, and warfarin is restarted that night. The heparin is continued in conjunction with warfarin until the INR is in the therapeutic range, and the patient is usually discharged by Saturday. The unfortunate reality of the anticoagulation saga is that patients rarely bleed in the hospital before discharge or even three or four days after polypectomy. The real risk occurs five to 14 days after polypectomy, when the scar sloughs and the patient may bleed massively when he or she is no longer in or nearby the hospital. This is a risk that should be explained to the patient at the time of the discussion concerning anticoagulants. It is possible that the use of low molecular weight heparin may obviate the entire hospitalization period for patients who require anticoagulation for high risk conditions. This is, as yet, unknown and untested.

ASA AND OTHER NSAID USE BEFORE COLONOSCOPY

In the absence of a pre-existing bleeding disorder, elective procedures may be performed in patients taking ASA or other NSAIDs. Urgent procedures should not be delayed because of ASA or other NSAID use.

ANTIBIOTIC PROPHYLAXIS

The American Heart Association has approved new guidelines on the prevention of bacterial endocarditis (9). For the first time, the American Heart Association had input from gastroenterologists, and the American Society for Gastrointestinal Endoscopy approved the statement as it relates to gastroenterology. The statement is as follows.

The risk of endocarditis as a direct result of an endoscopic procedure is small. Transient bacteremia may occur during or immediately after endoscopy; however, there are few reports of infective endocarditis attributable to endoscopy. For most gastrointestinal endoscopic procedures, the rate of bacteremia is 2% to 5%, and the organisms typically identified are unlikely to cause endocarditis. The rate of bacteremia does not increase with mucosal biopsy, polypectomy, or

TABLE 3
High and low risk conditions for thromboembolism

High risk conditions	Low risk conditions
Atrial fibrillation associated with valvular heart disease	Deep vein thrombosis
Mechanical valve in the mitral position	Uncomplicated or paroxysmal non-valvular atrial fibrillation
Mechanical valve and prior thromboembolic event	Bioprosthetic valve
	Mechanical valve in the aortic position (8)

sphincterotomy. There are no data to indicate that deep biopsy, as may be performed in the rectum or stomach, leads to a higher rate of bacteremia.

In this article, it is stated that "endocarditis prophylaxis is not recommended" for the following: upper intestinal endoscopy or colonoscopy with or without gastrointestinal biopsy (with or without polypectomy), although prophylaxis is optional for high risk patients. The high risk patient category includes those with prosthetic cardiac valves, including bioprosthetic and homograft valves, previous bacterial endocarditis, complex cyanotic congenital heart disease and surgically constructed systemic pulmonary shunts or conduits.

The American Society for Gastrointestinal Endoscopy has previously published guidelines for antibiotic prophylaxis (10). These guidelines are the ones that have been adopted by the American Heart Association.

Other cardiac lesions or conditions may be associated with an increased risk of infective endocarditis (over the general population) but are less likely to lead to endocarditis than the high risk lesions. These 'intermediate risk' lesions include most congenital cardiac malformations, rheumatic and other acquired valvular dysfunctions, hypertrophic cardiomyopathy and mitral valve prolapse with valvular regurgitation.

Cardiac lesions or conditions that do not confer an increased risk of endocarditis over the general population include previous coronary artery bypass graft surgery, cardiac pacemakers, mitral valve prolapse or previous rheumatic fever without valvular dysfunction or regurgitation. There are no data to recommend antibiotic prophylaxis for these low risk conditions.

For most endoscopic procedures, including upper endoscopy, sigmoidoscopy and colonoscopy with or without mucosal biopsy or polypectomy, antibiotic prophylaxis is not recommended for patients with cardiac lesions at intermediate risk for endocarditis or those with conditions at no increased risk.

The acceptable prophylaxis regimen for high risk patients is parenteral ampicillin 2 g and gentamycin 1.5 mg/kg (up to 80 mg) 30 mins before the procedure, followed by amoxicillin 1.5 g orally 6 h after the procedure; vancomycin 1 g intravenously may be substituted for the penicillin-allergic patient.

My recommendation is to follow the American Society for Gastrointestinal Endoscopy guidelines for antibiotic prophylaxis. For patients who have been told that they need antibiotic coverage for mitral valve prolapse or prosthetic joints, I usually prescribe amoxicillin, 2 g, taken 2 h before the examination. A follow-up antibiotic dose is no longer recommended after the amoxicillin dose (9). Erythromycin is no longer recommended for penicillin-allergic individuals, but clindamycin and other alternatives are offered.

SEDATION

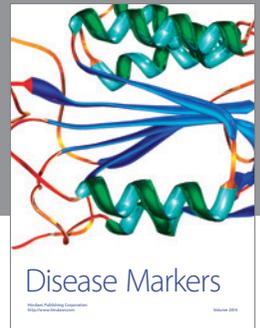
Sedation for colonoscopic procedures varies from place to place and country to country. In Germany, sedation is rarely given for colonoscopic examinations, while in France, anesthesiologists usually administer an intravenous dose of propofol (Diprivan, Zeneca, Wilmington, Delaware). These medications are not used by endoscopic physicians in the absence of an anesthesiologist. I give 50 mg of pethidine hydrochloride (Demerol, Sanofi Pharmaceuticals, New York, New York) and 10 mg of diazepam (Valium, Roche, Basel, Switzerland) intravenously through a butterfly needle just immediately before the endoscopic examination. These doses are for the average-sized patient. If more sedation is necessary, I usually add midazolam as a 'rescue drug' for its amnesic properties in doses of 1 to 2 mg intravenously. I prefer not to give pethidine/meperidine in a dose greater than 75 mg and rarely give diazepam in doses greater than 10 mg per case. If the patient is over the age of 75 years, the intravenous diazepam dosage is decreased to 7.5 mg, and at age 80 years the dose of diazepam is 2.5 to 5.0 mg, while the amount of meperidine is 25 mg. For patients older than 85 years of age, I usually use 25 mg of pethidine and 2.5 mg of diazepam. In my opinion, midazolam is a perfectly good drug for colonoscopic premedication, but patients usually do not remember when the physician talks with them and discusses their case after the endoscopic procedure. This results in patients requiring discussion about their case on two occasions: first, after the procedure, when the patient appears to be alert, awake and receptive (in addition, the family desires to know what was found, and thus the another discussion commences). The next day, the patient usually does not recall having spoken with the physician after the procedure, and this prompts a telephone call during which the entire discussion is repeated.

I do not use antispasmodics for premedication, nor do I use them during the examination. I do not believe that spasm is an important factor in the ease with which the

colonoscopic examination is conducted. I do not use droperidol, although some of my colleagues find it to be quite useful. I do not use running intravenous fluids. For all patients who have had in-office sedation, naloxone hydrochloride (Narcan, DuPont Pharma) 0.4 mg is given intravenously following the procedure. The time interval over which the initial medication is given is fairly short, with both medications being infused in a total of approximately 30 to 60 s. This is followed by saline given via a 10 mL syringe. The butterfly needle remains in situ during the examination and is used for the administration of naloxone. All patients who are sedated are monitored with a pulse oximeter, continuous blood pressure readings and pulse measurement. Oxygen is not routinely administered to patients undergoing endoscopy with intravenous sedation. Should the oxygenation fall below 85%, patients are roused and requested to breathe deeply. For the few patients who have profound respiratory depression, oxygen is available and naloxone is given.

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