Old habits die hard…. ..or, is there evidence to support the use of mechanical bowel preps and oral antibiotics for elective colorectal surgery??

There is no literature that supports the use of mechanical colon preparation to reduce infection risk. I recently reviewed this topic and in a number of randomized trials from Europe and Israel that have been recently published, use of a mechanical bowel prep tended to INCREASE surgical complications. Mechanical bowel preps are one of those interventions that everyone does because they were trained that way (and because it seems like it makes sense) but has not, until recently, been subjected to randomized clinical trials.

See below:

Guenaga KF, et al. Cochrane Database Syst Rev. 2003;(2):CD001544.

Mechanical bowel preparation for elective colorectal surgery.

BACKGROUND: For more than a century the presence of bowel content during surgery has been related to anastomotic leakage. Mechanical bowel preparation has been considered an efficient agent against leakage and infections complications. This dogma is not based on solid evidence, but more on observational data and expert's opinions. OBJECTIVES: To determine the security and effectiveness of prophylactic mechanical bowel preparation for morbidity and mortality rates in colorectal surgery. The following hypothesis was tested: "The use of mechanical bowel preparation before elective colorectal surgery reduces the incidence of postoperative complications". SEARCH STRATEGY: All publications describing mechanical bowel preparation before elective colorectal surgery was sought through computerized searches of EMBASE, LILACS, MEDLINE, and Cochrane Library; by hand-searching in relevant medical journals, from major gastroenterological congresses, without limitation for date and language, using the search strategy described by the Colorectal Cancer Review Group. In addition, randomised clinical trials will be searched through personal communication with colleagues and from conference proceedings SELECTION CRITERIA: STUDIES: All randomised, clinical trials, that were performed in order to answer the hypothesis. PARTICIPANTS: Patients submitted elective colorectal surgery. INTERVENTIONS: Any strategy in mechanical bowel preparation compared with no mechanical bowel preparation. PRIMARY OUTCOME MEASURES: 1. Anastomosis leakage- stratified for rectum and colon 2. Overall anastomotic leakage SECONDARY OUTCOME MEASURES: 3. Mortality 4. Peritonitis 5. Re operation 6. Wound Infection 7 Infectious extra-abdominal complication 8. Non-infection extra-abdominal 9. Overall surgical site infections DATA COLLECTION AND ANALYSIS: Data was independently extracted by two reviewers and cross-checked. The methodological quality of each trial was assessed by the same two reviewers. Details of the randomisation (generation and concealment), blinding, whether an intention-to-treat analysis was done, and the number of patients lost to follow-up was recorded. The results of each RCT was summarised in 2 x 2 tables for each outcome. For analysis the Peto-Odds ratio was used as defaults (no statistical heterogeneity was observed) MAIN RESULTS: Of the 1159 patients with anastomosis (6 RCTs), 576 were allocated for mechanical bowel preparation (groups 1) and 583 for no preparation (groups 2) before elective colorectal surgery. Of 1204 patients totally enrolled 595 were in groups 1 and 609 in groups 2. PRIMARY OUTCOMES: 1) Anastomotic leakage -

stratified:A) Low anterior resection: 12.5% (6 of 48 patients in 1) compared with 12% (6 of 50 patients in 2); Peto OR 1.17, 95% CI: 0.35 - 3.96 (non-significant) B) Colonic surgery: 1.16% (2 of 172 patients in 1) compared with 0.6% (1 of 166 patients in 2); Peto OR 1.75, 95% CI: 0.18 - 17.02 2) Overall anastomotic leakage: 5.5% (32 of 576 patients in 1) compared with 2.9% (17 of 583 patients in 2); Peto OR 1.94, 95% CI: 1.09 - 3.43 (P=0.02) SECONDARY OUTCOMES: 3) Mortality: 0.6% (2 of 329 patients in 1) compared with 0% (0 of 326 patients in 2); Peto OR 7.95, 95% CI: 0.49 - 128.34 (non-significant) 4) Peritonitis: 5.1% (13 of 254 patients in 1) compared with 2.8% (7 of 252 patients in 2); Peto OR 1.90, 95% CI: 0.78 -4.64) (non significant) 5) Reoperation: 3.3% (11 of 329 patients) compared with 2.5% (8 of 326 patients); Peto OR 1.40, 95% CI: 0.56 - 3.49) (non-significant) 6) Wound infection: 7.4% (44 of 595 patients in 1) compared with 5.7% (35 of 609 patients in 2); Peto OR 1.34, 95% CI: 0.85 - 2.13 (non-significant) 7) Infectious extra-abdominal complication: 8.3% (14 of 168 patients in 1) compared with 9.4% (15 of 159 patients in 2); Peto OR, 95%: 0.87 (0.41 - 1.87) 8) Non-infection extra-abdominal complication: 8.0% (20 of 250 patients in 1) compared with 7.0% (17 of 246 patients in 2); Peto OR 1.19, 95% CI: 0.61 - 2.32 (non-significant) - 9) Surgical site infection: 9.8% (31 of 325 patients in 1) compared with 8.3% (27 of 322 patients in 2); Peto OR 1.20, 95% CI: 0.70 - 2.05 (non-significant) - REVIEWER'S CONCLUSIONS: The results failed to support the hypothesis that bowel preparation reduces anastomotic leak rates and other complications. There was no a priori hypothesis that bowel preparation may increase anastomotic leak rates, so this was not stated. Thus, the routine use of mechanical bowel preparation in patients undergoing elective colorectal surgery is questioned.

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Zmora O, et al. Tech Coloproctol. 2006 Jul;10(2):131-5. Epub 2006 Jun 19.
Is mechanical bowel preparation mandatory for left-sided colonic anastomosis? Results of a prospective randomized trial.

BACKGROUND: Preoperative mechanical bowel preparation is aimed to reduce the risk of infectious complications, and its utility is a dogma in left-sided large bowel anastomosis. The aim of this study was to specifically assess whether colocolonic and colorectal anastomoses may be safely performed without preoperative mechanical bowel preparation. METHODS: Patients undergoing elective colon and rectal surgery with primary colocolonic or colorectal anastomosis were prospectively randomized into two groups. The "prep" group had mechanical bowel preparation prior to surgery, while the "non-prep" group had surgery without pre-operative mechanical bowel preparation. RESULTS: Two hundred forty-nine patients were included in the study, 120 in the prep group and 129 in the nonprep group. Demographic characteristics, indications for surgery, and type of surgical procedure did not significantly differ between the two groups. There was no difference in the rate of surgical infectious complications between the two groups. Overall infectious complication rate was 12.5% in the prep group and 13.2% in the non-prep group. Wound infection, anastomotic leak, and intra-abdominal abscess occurred in 6.6%, 4.2%, and 1.6% of patients in the prep group and in 10.0%, 2.3%, and 0.7% of patients in the nonprep group, respectively (p=NS). CONCLUSIONS: These results suggest that elective left-sided anastomosis may be safely performed without mechanical preparation. Multicenter studies to test the reproducibility of these results are required, to support a change in this time-honored practice.

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Zmora O, et al. Ann Surg. 2003 Mar;237(3):363-7.

Colon and rectal surgery without mechanical bowel preparation: a randomized prospective trial.

OBJECTIVE: To assess whether elective colon and rectal surgery can be safely performed without preoperative mechanical bowel preparation. SUMMARY BACKGROUND DATA: Mechanical bowel preparation is routinely done before colon and rectal surgery, aimed at reducing the risk of postoperative infectious complications. However, in cases of penetrating colon trauma, primary colonic anastomosis has proven to be safe even though the bowel is not prepared. METHODS: Patients undergoing elective colon and rectal resections with primary anastomosis were prospectively randomized into two groups. Group A had mechanical bowel preparation with polyethylene glycol before surgery, and group B had their surgery without preoperative mechanical bowel preparation. Patients were followed up for 30 days for wound, anastomotic, and intra-abdominal infectious complications. RESULTS: Three hundred eighty patients were included in the study, 187 in group A and 193 in group B. Demographic characteristics, indications for surgery, and type of surgical procedure did not significantly differ between the two groups. Colo-colonic or colorectal anastomosis was performed in 63% of the patients in group A and 66% in group B. There was no difference in the rate of surgical infectious complications between the two groups. The overall infectious complications rate was 10.2% in group A and 8.8% in group B. Wound infection, anastomotic leak, and intra-abdominal abscess occurred in 6.4%, 3.7%, and 1.1% versus 5.7%, 2.1%, and 1%, respectively. CONCLUSIONS: These results suggest that elective colon and rectal surgery may be safely performed without mechanical preparation.

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Bucher P, et al. Br J Surg. 2005 Apr;92(4):409-14.
Randomized clinical trial of mechanical bowel preparation versus no preparation before elective left-sided colorectal surgery.

BACKGROUND: Mechanical bowel preparation (MBP) is performed routinely before colorectal surgery to reduce the risk of postoperative infectious complications. The aim of this randomized clinical trial was to compare the outcome of patients who underwent elective left-sided colorectal surgery with or without MBP. METHODS: Patients scheduled for elective left-sided colorectal resection with primary anastomosis were randomized to preoperative MBP (3 litres of polyethylene glycol) (group 1) or surgery without MBP (group 2). Postoperative abdominal infectious complications and extra-abdominal morbidity were recorded prospectively. RESULTS: One hundred and fifty-three patients were included in the study, 78 in group 1 and 75 in group 2. Demographic, clinical and treatment characteristics did not differ significantly between the two groups. The overall rate of abdominal infectious complications (anastomotic leak, intra-abdominal abscess, peritonitis and wound infection) was 22 per cent in group 1 and 8 per cent in group 2 (P = 0.028). Anastomotic leak occurred in five patients (6 per cent) in group 1 and one (1 per cent) in group 2 (P = 0.210) [corrected] Extra-abdominal morbidity rates were 24 and 11 per cent respectively (P = 0.034). Hospital stay was longer for patients who had MBP (mean(s.d.) 14.9(13.1) versus 9.9(3.8) days; P = 0.024). CONCLUSION: Elective left-sided colorectal surgery without MBP is safe and is associated with reduced postoperative morbidity.

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Therefore, absence of a bowel prep before surgery is NOT a reason to continue antibiotics postoperatively.

What about oral antibiotic prophylaxis……

Espin-Basany E, et al. Prospective, randomised study on antibiotic prophylaxis in colorectal surgery. Is it really necessary to use oral antibiotics? Int J Colorectal Dis. 2005 Nov;20(6):542-6.

BACKGROUND AND AIMS: The use of prophylactic antibiotics in addition to mechanical cleansing is the current standard of care prior to colonic surgery. The question of whether the antibiotics should be administered intravenously or orally, or by both routes, remains controversial. Our aim was to compare three methods of prophylactic antibiotic administration in elective colorectal surgery. METHODS: Three hundred consecutive elective colorectal resections were studied. All patients had preoperative mechanical colon cleansing with oral sodium phosphate and intravenous antibiotic prophylaxis with cefoxitin (one dose before skin incision and two postoperative doses). Patients were randomised to one of the following three groups: group A: three doses of oral antibiotic (neomycin and metronidazole) at the time of mechanical colon cleansing; group B: one dose of oral antibiotic; group C: no oral antibiotics. All patients were followed during their hospital stay and at 7, 14 and 30 days post-surgery. RESULTS: Vomiting occurred in 31%, 11% and 9% of the studied patients (groups A, B and C, respectively) ($p<0.001$). Nausea was present in 44%, 18% and 13% of patients ($p<0.001$). Abdominal pain was recorded in 13%, 10% and 4% of patients (p: 0.077). Wound infection was present in 7%, 8% and 6% and suture dehiscence occurred in 2%, 2% and 3% of the patients in the three groups (no differences among them). Neither were differences found among the three groups in terms of urinary infections, pneumonia, postoperative ileus or intra-abdominal abscess. CONCLUSION: The addition of three doses of oral antibiotics to intravenous antibiotic prophylaxis is associated with lower patient tolerance in terms of increased nausea, vomiting and abdominal pain, and has shown no advantages in the prevention of postoperative septic complications. Therefore, we recommend that oral antibiotics should not be used prior to colorectal surgery.

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Wren SM, et al. Preoperative oral antibiotics in colorectal surgery increase the rate of Clostridium difficile colitis. Arch Surg. 2005 Aug;140(8):752-6.

HYPOTHESIS: Bowel preparation traditionally consists of cathartics, oral antibiotics, and intravenous antibiotics. We hypothesize that the use of oral antibiotics in bowel preparation results in a higher rate of postoperative Clostridium difficile colitis. DESIGN: Retrospective case-controlled study of elective colon surgery patients; January 1997 to June 2003. SETTING: Tertiary care veterans administration hospital. PATIENTS: Records of patients who underwent elective colorectal surgery (n = 304) were reviewed. Patients with bowel obstruction or emergent operation were excluded. MAIN OUTCOME MEASURE: Detection of C difficile toxin A/B by enzyme-linked immunosorbent assay in a stool specimen within 30 days of surgery. RESULTS: All 304 patients received both cathartics and intravenous antibiotics. Of 304 patients, 107 (35.1%) received oral antibiotics. The rate of postoperative C difficile colitis was 4.2% in the entire study population. The rate of C difficile infection was higher in patients who received oral

antibiotics (7.4%) compared with patients who did not receive oral antibiotics (2.6%; P = .03). There were no C difficile-related mortalities. CONCLUSION: Oral nonabsorbable antibiotics in bowel preparation resulted in a higher rate of C difficile infection. This may be due to the additional effect of oral antibiotics on normal bowel flora. We recommend that oral nonabsorbable antibiotics not be used in preoperative bowel preparation regimens since postoperative C difficile infection can lead to additional morbidity, length of stay, and hospital costs.

Dale

Dale W. Bratzler, DO, MPH
QIOSC Medical Director
Oklahoma Foundation for Medical Quality
14000 Quail Springs Parkway, Suite 400
Oklahoma City, OK 73134
phone: (405) 840-2891, Ext. 209
fax: (405) 840-1343
e-mail: dbratzler@okqio.sdps.org