



To prep, or not? Evidence is against mechanical bowel preparation in gynecologic surgery

➡ Despite the long history of preoperative bowel preparation, data suggest it has little value in most settings, including benign gynecologic surgery

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Think mechanical bowel preparation (MBP) is a must for gynecologic surgery?

Think again.

Although MBP has been around since the 1930s, a growing body of data suggest that, with rare exception, gynecologists can eliminate routine use of preoperative MBP from their practice.

In this article, we discuss the evidence surrounding MBP so that you can assess the benefits and risks it poses for your surgical patients.

Unproven assumptions are behind MBP

For most of the past century, MBP has been used in advance of abdominal surgery,

including gynecologic surgery. Clinicians made the rational assumption that, by decreasing the fecal load within the colon, they could lower the risk of certain surgical complications, especially during an era when antibiotics were not available to treat serious infectious morbidity.

In modern times, the practice has continued when major abdominal surgery is planned. Why? Because surgeons believe it will reduce the risk of wound infection, anastomotic leakage, and bowel spillage in the event of injury, and that it will increase the ease of bowel manipulation.¹

A growing body of literature challenges these assumptions and suggests that MBP is not associated with these benefits—and may even increase the incidence of some of these complications. Moreover, the induction of profuse, watery diarrhea to evacuate the colon before surgery has been associated with severe electrolyte imbalance, renal failure, and difficult intraoperative fluid management.

These risks make a thorough assessment of MBP's effects imperative to guide optimal practice.

MBP defined

MBP is the chemical or physical process of eliminating fecal matter from the intestinal

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Key points for the use (or avoidance) of mechanical bowel preparation

- Mechanical bowel prep has **many side effects**, ranging from mild (discomfort) to severe (renal failure).
- **The risks of surgical site infection and anastomotic leakage are not lower** with MBP, compared with no preparation, in patients undergoing elective colon surgery.
- **MBP does not reduce the risk of intraoperative contamination** of the surgical field.
- In unplanned injuries to unprepared colon (e.g., in cases involving trauma), **primary anastomosis is the recommended mode of repair** rather than diverting colostomy.
- **MBP does not ease bowel manipulation** in laparoscopy, compared with no preparation.
- **The only proven value of MBP is to improve visibility during intraoperative colonoscopy.**
- **Gynecologists can eliminate the routine use of MBP** from their surgical practice.

FAST TRACK

Avoid the use of liquid sodium phosphate for preoperative mechanical bowel preparation because it has been associated with renal failure

tract. There are a variety of methods, including ingestion of an oral preparation and enemas and suppositories. Historically, MBP included stimulant laxatives, such as senna extract and castor oil, and hyperosmotic solutions, such as mannitol and lactulose.

MBP is distinctly separate from *antibiotic* bowel preparation and preoperative prophylactic antibiotics, both of which fall beyond the scope of this article.

The most common forms of MBP prescribed today are balanced electrolyte solutions, including polyethylene glycol, and saline laxatives, such as magnesium citrate and sodium phosphate.²

Some investigators have attempted to determine which MBP formulations are most effective, based on visualization during colonoscopy, but a recent meta-analysis suggests that most formulations perform similarly.³

MBP carries established risks

The risks associated with MBP are clearly documented in the literature and range in intensity from mild to severe. Overall, patients report discomfort, with symptoms such as abdominal pain and distension,

nausea and vomiting, weakness, and insomnia.⁴ High-volume preparations, such as polyethylene glycol, are unpalatable to patients and, therefore, less likely to be ingested completely, leaving the surgeon with a partially evacuated colon.

Dehydration and electrolyte disturbances may also complicate the use of MBP, particularly with saline laxatives. Although young patients can likely tolerate electrolyte shifts without severe sequelae, elderly patients who have comorbid heart and kidney disorders may become further deconditioned during the MBP process. Seizures and esophageal tears have been reported as a result of MBP.⁵ Sodium phosphate, in particular, is associated with renal failure, with 171 cases reported to the US Food and Drug Administration (FDA) from 2006 to 2007—leading to an issued warning not to employ this agent in preoperative MBP in the liquid formulation.⁶

In addition, in one study, investigators observed an increased time to the return of bowel function and a prolonged hospital stay among patients who underwent MBP.⁷

Purported benefits of MBP Reducing the risk of surgical site infection

Surgical site infection (SSI)—whether intra-abdominal or in the superficial wound—is a serious complication that can lead to severe morbidity. As colorectal surgeons began performing more aggressive colon surgery in the 1930s, 40s, and 50s, they sought a way to reduce SSI. Mortality from colon surgery was 10% to 30%, with a rate of SSI of 80% to 90%, so surgeons began to seek a method to decrease the fecal bacterial load, presuming that doing so would also reduce the rates of infection and mortality and allow for primary repair of the colon. MBP appeared to address the problem.¹

The practice of MBP then spread from colorectal surgery to other areas of general and gynecologic surgery without clear evidence from randomized trials that it was necessary or beneficial.⁸ As surgical techniques

improved over the ensuing decades, and antibiotics evolved, mortality and SSI rates dropped—although it is unclear whether this drop in infection is attributable to MBP.¹

In the 1990s, researchers began to question the value of MBP in surgical practice. Multiple randomized, controlled trials in the colorectal literature have demonstrated that MBP does not reduce the rate of incisional or deep SSI, compared with no bowel preparation.⁹⁻¹¹ The populations studied in these trials were undergoing planned bowel resection and primary re-anastomosis—procedures known to elevate the risk of contamination, unlike the majority of gynecologic surgical procedures. **Even in this higher-risk population, however, MBP failed to reduce the risk of SSI, suggesting that, in less contaminated surgeries, it would have even fewer benefits.**

In its practice bulletin on antibiotic prophylaxis from 2009, the American Congress of Obstetricians and Gynecologists (ACOG) noted: “There is no evidence that mechanical bowel preparation further reduces infection risk” beyond the reduction achieved with routine use of perioperative antibiotics.¹²

Preventing anastomotic leakage

Investigators have suggested that MBP reduces the risk of anastomotic leaks of the colon by decreasing contamination at the suture site.¹³ A close review of the colorectal literature, however, reveals that MBP does not affect anastomotic leakage in patients who undergo planned colon resection and primary re-anastomosis.^{9,10,14-17}

A 2011 Cochrane review that included 5,805 patients undergoing elective colon and rectal surgery confirmed that neither oral nor rectal MBP was associated with any benefit in terms of the rates of anastomotic leakage and SSI.¹⁰ Some randomized studies have found nonstatistically significant reductions in the anastomotic leakage rate in patients who did *not* undergo MBP—a finding attributed to the lack of denuded mucosa and inflammation in the unprepared colon.^{9,15,18}

However, one large, randomized, clinical trial of more than 1,000 patients found

that, when anastomotic leakage did occur, the risk of infection was greater among patients who had not undergone MBP.¹⁹

Reducing the rates of intraoperative contamination and colon injury

Planned resection and inadvertent colon injury both have the potential to contaminate the surgical field, increasing the risk of morbidity. Surgeons have turned to MBP to minimize this risk in the planned surgical setting, although the practice does not appear to reduce infection or the risk of subsequent anastomotic leakage. It is largely unknown how bowel preparation affects bowel spillage during colon resection. Most investigators empirically believe that MBP will reduce bowel spillage during planned colon resection in an uncontaminated field,¹³ although one prospective study suggested a trend toward increased spillage of bowel contents and intraoperative contamination in patients who had undergone MBP.²⁰

In gynecologic surgery for benign conditions, colon resection is generally unplanned, usually the result of inadvertent colon injury or unexpected findings. Traditional teaching has been that, if an unprepared colon becomes injured, the patient requires a colostomy rather than primary anastomosis, simply because there are bowel contents contaminating the surgical field.

Gynecologists may be hesitant to challenge this practice because the choice of primary anastomosis versus colostomy is often made by the consulting general surgeon. Given the low risk of bowel injury (estimated to be <2% in gynecologic surgery) and emerging data on fecal contamination and bowel resection in the trauma literature, **MBP may be unnecessary on a population-wide basis.**²¹

In fact, the trauma literature might be instructive in understanding how inadvertent colon injury in gynecologic surgery should be managed, regardless of the patient’s bowel-preparation status. Multiple randomized, controlled trials of colostomy versus primary anastomosis in trauma



MBP does not reduce the rate of incisional or deep surgical site infection, compared with no bowel preparation



FAST TRACK

Multiple randomized, controlled trials of colostomy versus primary anastomosis in trauma patients who had penetrating colon injuries found no difference in the rates of mortality and complications

patients who had penetrating colon injuries demonstrated no difference in the rates of mortality and complications, including SSI and anastomotic leakage.²²⁻²⁴ Both colorectal and trauma surgeons performed planned and unplanned colectomy and primary re-anastomosis without MBP.

Based on these data, the recommended practice in trauma surgery is primary repair of the colon, confirming that the unprepared colon can be safely re-anastomosed, even in a grossly contaminated field. Extrapolating from this literature, **it stands to reason that colon injury at the time of gynecologic surgery without preoperative MBP could also be managed primarily**, eliminating the impetus for gynecologists to use MBP to avoid bowel diversion.

Although evidence-based practice is highly recommended, it is important to recognize that it is beyond the scope of most general gynecologists to perform bowel resection and anastomoses in the event of inadvertent bowel injury. Gynecologic surgeons must know the practice patterns of their local institution; if the general surgeons in that institution do not follow

current recommendations, it may be prudent to continue to use MBP in cases that carry a high risk of bowel injury to avoid a potential colostomy.

Easing bowel manipulation

Some gynecologists continue to use MBP in cases at low risk for bowel injury because they are concerned about the ease of operation and want to ensure good visibility, particularly when laparoscopy is involved. Muzii and colleagues conducted a randomized, single-blinded study of MBP versus no preparation in benign cases managed by gynecologic laparoscopy. The surgeons were blinded as to whether or not the patient had undergone MBP; at the conclusion of the procedure, these surgeons rated the ease of operation and visualization based on the quality of the surgical field, evaluation of the small and large bowel, and surgical difficulty. MBP was not associated with any measured outcome, including complications, surgical time, and self-assessed ease of operation—although patients reported significantly more discomfort with MBP.⁴

Easing intraoperative colonoscopy

Experts agree that planned or potential intraoperative colonoscopy is a clear indication for adequate bowel preparation.¹⁰ A smaller body of evidence suggests that, when “subtle palpation of the bowel wall” is required, MBP may help the surgeon avoid mistaking a nodule for stool.^{5,25}

Beyond these examples, routine MBP is not supported by randomized data.

We sorely need guidelines on MBP

Like many general and colorectal surgeons, many gynecologists still use MBP. A 2011 survey of Canadian gynecologic oncologists reported that 47% still routinely order MBP, although 77% of surgeons acknowledged a lack of “good evidence” to support the practice.²⁶ Similarly, although 95% of colorectal surgeons in Michigan in 2011 believed that the data against routine use of MBP was

ILLUSTRATION: SHUTTERSTOCK

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scientifically valid, only 50% agreed that MBP was unnecessary.²⁷ Data from Spain echo these results: 77% of surgeons viewed bowel preparation as useful or very useful.²⁸

The striking contrast between literature and practice merits scrutiny. When the literature demonstrates no need for MBP and a risk of patient harm, **why are so many surgeons still electing preoperative MBP for their patients?** Reasons listed by gynecologic oncologists in a 2011 survey varied but included a reduction in anastomotic leakage (31%) and improved visualization (37%)—reasons unsupported by the randomized literature. A majority (71%) agreed that guidelines would be helpful in determining the appropriate use of MBP, if any.²⁶ Overall, ACOG has not laid out clear guidelines on the use or avoidance of MBP to support gynecologic surgeons' decision-making.

MBP is an antiquated practice

The colorectal literature has identified MBP as an antiquated practice without evidence to support its routine use. Therefore, mechanical bowel preparation is likely to be of minimal value for patients undergoing major gynecologic surgery, based on extensive data from randomized trials of planned bowel surgery.²⁹ The role of MBP in laparoscopic, robotic, and vaginal surgery is less clearly defined, although there is no clear evidence to support the use of MBP in any surgical modality except intraoperative colonoscopy. Despite the lack of clear guidance from ACOG, the colorectal and gynecologic literature strongly suggests that MBP does not reduce the risk of SSI or intraoperative or postoperative complications. Nor do surgical ease and visibility appear to be improved with MBP, though the literature in this area is limited.

MBP is not without risk, particularly for elderly patients who have medical comorbidities. Without clearly established benefits, we recommend that you strongly consider these randomized data and limit—or even eliminate—the use of MBP for major abdominal procedures in your practice. 🚫

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There is no clear evidence to support the use of MBP in any surgical modality except intraoperative colonoscopy

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