



# Special Considerations for Colorectal Surgery in the Elderly IBD Patient

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## Abstract

*Purpose of review* We sought to understand the key aspects to optimize in the perioperative period when treating an elderly surgical patient with inflammatory bowel disease.

*Recent findings* Addressing preoperative polypharmacy, frailty, and nutrition is important in the elderly population. Understanding intraoperative principles of oncologic risk and pouch formation and the advantages of laparoscopy are key. Postoperative-enhanced recovery pathways and VTE prophylaxis are essential for high-quality care.

*Summary* Preoperative, perioperative, and postoperative factors can greatly impact elderly patients' surgical outcomes.

## Introduction

Inflammatory bowel disease (IBD) is a disease of the gastrointestinal tract which takes on the two primary phenotypes of Crohn's disease (CD) and ulcerative colitis (UC), both of which are idiopathic chronic inflammatory diseases with an unknown etiology. The incidence of IBD continues to increase for unknown reasons

[1]. Simultaneously, individuals over the age of 65 represent the fastest growing age group, expected to increase by 31% over the next decade in the USA. While the peak diagnostic age of IBD is 20 to 35 years, a second peak is seen in individuals aged 50 to 70 years old [2]. With both the increasing number of elderly and the increasing

incidence of late-onset IBD [3], there is certainly a rapidly increasing number of individuals with IBD over the age of 65 years.

Despite the ever-expanding number of available therapeutic agents used to treat IBD including corticosteroids, immunomodulators, and biologics, up to 30% of patients with UC and 60% of patients with CD will require an intestinal resection at some point during their disease course for medically refractory disease or complications related to their IBD. Medically, refractory disease is the most common reason for elderly IBD patients to have surgery [4,5] While some studies have suggested a higher absolute risk of surgery for IBD in elderly [6•],

others suggest that elderly UC patients were less likely to undergo surgery than young UC patients, and CD patients were just as likely to undergo surgery regardless of being young or old age [4]. Among those elderly IBD patients that did undergo surgery, risk factors for adverse postoperative outcomes included advanced age, male gender, hypoalbuminemia, and urgent surgery [7]. Therefore, it is especially important to recognize and consider the elderly IBD surgical patient in order to optimize postoperative patient outcomes, as there are special considerations in the preoperative, perioperative, and postoperative phases.

## Preoperative considerations

### Polypharmacy

#### Suggestions

Polypharmacy is more prevalent in elderly than in young adults. Defined as taking more than four to six medications concurrently [8,9], polypharmacy has doubled in the past 20 years [8,9]. In nonsurgical patients, polypharmacy is associated with an increased risk of falls, poor functional status, hip fracture, unplanned hospital admissions, and increased mortality [10]. Thus, it is not surprising that polypharmacy has adverse effects on the postoperative period in surgical patients [11]. In a recent systematic review of polypharmacy in non-cardiac elective surgical patients, overall mortality, morbidity, and hospital resource utilization were higher in patients with polypharmacy versus those without. Interestingly, even after controlling for patient comorbidity, polypharmacy was independently associated with patient morbidity and mortality, underscoring that this may be a separate and compounding risk factor in addition to patient comorbidity and frailty [12]. Consequently, having patients evaluated by a medical team or geriatrics in the preoperative period to minimize unnecessary medications is critical, as is a pharmacologic review of all medications to prevent drug to drug interactions. These consultations could prevent polypharmacy and mitigate its adverse effects, thereby decreasing morbidity and mortality.

### Frailty

In general, elderly IBD patients are hospitalized more often than younger patients. Ananthakrishnan et al. [13] reported that 25% of all IBD-related hospital admissions in the USA were in patients aged over 65 years. IBD patients are more likely to be malnourished, anemic, and ill, with longer postoperative hospital stays than non-IBD patients. This is especially true in the surgical cohort. Not surprisingly, the majority of the healthcare spending associated with IBD pertains to the cost of hospitalization and surgery [13–15]. Increased age is an independent risk factor for hospital fatality in these patients [16–18].

Frailty is an emerging metric being utilized for preoperative intervention and optimization of outcomes. Frailty is defined as an age-related, multi-dimensional state of decreased physiologic reserve that results in diminished resiliency, loss of adaptive capacity, and increased vulnerability to stressors [19]. Not surprisingly, frailty is associated with adverse postoperative outcomes. Currently, there are multiple methods for measuring frailty, with over 20 frailty scales in use. All of these are largely based on two frailty models: the phenotype model [20] and the Frailty Index [21] or cumulative deficit model. The phenotype model deems a patient frail if they have three or more of five features including slowness, weakness, exhaustion, weight loss, and low physical activity. The Frailty Index calculates a low, intermediate, or high risk score based on deficits including comorbidities, physical and cognitive impairments, psychosocial risk factors, and common geriatric syndromes [21]. For surgical patients, there are several frailty indexes which have been developed, some more cumbersome than others with regard to data collection. One model based on the concept of "accumulating deficits" is a 70-item index integrating medical, psychological and functional capabilities. While this model has been validated in numerous studies, the 70-item index is cumbersome. A less tedious 11-item frailty index was developed by mapping the National Surgical Quality Improvement Program (NSQIP) variables to the 70-item index, which has now also been validated in several surgical studies, and may prove more realistic than the 70-item scale [22,23].

Regardless of the metric used, frailty is an important preoperative assessment, as it is associated with postoperative morbidity, mortality, and prolonged length of stay [24]. By screening for frailty preoperatively and being able to intervene on modifiable risk factors, postoperative morbidity and mortality can be reduced [25••]. In fact, a joint statement from the American College of Surgeons and the American Geriatrics Society now recommends frailty assessment as part of the preoperative assessment for older surgical patients [26].

Once the diagnosis of frailty is made, then physicians should engage in shared decision-making, prehabilitation, and interdisciplinary geriatric co-management. Shared decision-making includes discussions around all surgical options and possible outcomes, anticipated recovery situation and environment, and advanced care planning. Prehabilitation includes things such as physical exercise and nutritional counseling, known to improve outcomes [27,28]. Prehabilitation should be done for at least 4 weeks prior to surgery [29] for optimal benefits, but may last up to 6 to 8 weeks, and can even extend after discharge for ongoing benefits in the form of rehabilitation. In colorectal studies specifically, prehabilitation resulted in improved walking distance and respiratory endurance [30]. Given the time needed for prehabilitation, it is generally best utilized for elective surgical procedures; however, early recognition of potential surgical candidates by the medicine and surgical teams allows for early integration of prehabilitation measures to improve outcomes. Co-management with the geriatric service has been shown to markedly improve outcomes with decreased length of stay, improved pain control, early mobilization, and improved postoperative outcomes among several surgical disciplines [31,32] underscoring the importance in this for elderly IBD patients.

## Nutrition

Nutritional status correlates with postoperative morbidity and mortality. An expert panel from the 2012 North American Surgical Nutrition Summit suggested the use of the Nutrition Risk Screening 2002 to identify patients at risk for malnutrition preoperatively [33]. It was recommended that older patients who are malnourished have proactive nutritional intervention. Subsequently, the use of oral nutritional supplementation for frail elderly patients has been suggested in several guidelines [34]. Nutritional optimization should be screened for as part of the pre-surgical prehabilitation process and be addressed early in the surgical consideration process. If necessary, surgical intervention should be delayed to allow for nutritional optimization. The only reason not to delay surgery for nutritional optimization is if surgery is urgent or emergent and the benefits do not outweigh the possible risk of delay [35].

Interventions extending from the preoperative period into the postoperative period [29] improves outcomes. Enteral nutrition should always be utilized when able [33]. Adequate protein intake should include at least 1.5 g/kg/day in order to prevent a catabolic state with muscle loss [30,36]. In addition, adequate protein intake reduces major postoperative morbidity including infection. Interestingly, the enhanced recovery surgical protocols recommend preoperative carbohydrate loading, but this did not decrease complication rates [37].

## Perioperative considerations

### Risk of malignancy

Ten to fifteen percent of all-cause mortality in patients with IBD is related to colorectal cancer [38]. Many studies have shown an increased risk of colorectal cancer in patients with IBD, although the true incidence may not be as high as initially proposed [39,40]. Elderly have an increased risk for malignancy given their age. In IBD specifically, there has been concern that immunosuppressive medication could increase this risk [41]. In one large review of over 8000 patients, elderly IBD patients were found to be three times more likely to have malignancy than non-elderly IBD patients [39,42,43]. Given the risk is highest in chronic proctocolitis of long-standing duration, care should be thought for both preoperative endoscopy to rule out any malignancy prior to abdominal operation and performed a high ligation of any feeding vessel in order to get an adequate lymph node harvest with an adequate oncologic resection. Most abdominal operations are performed in a mesenteric sparing approach, but in an elderly patient with long-standing disease, a high ligation should be considered as this may be the safest approach in case of unrecognized or incidentally discovered neoplasm.

### Ileal pouch–anal anastomosis: to pouch or not?

Ileal pouch–anal anastomosis (IPAA) is the surgical technique of choice for restoration of intestinal continuity in patients with UC so long as patients have good sphincter function and no history of fecal incontinence [44,45]. The American Society of Colon and Rectal Surgeons recommended that chronological age not be an exclusion criterion for IPAA surgery but, rather, functional data points instead [46]. There is a theoretical concern for increased technical complications when performing pouches in the elderly. However, data from

Cleveland Clinic demonstrated a similar risk of anastomotic leaks, pouch-related septic complications [47], and pouch failure rates in younger and older patients undergoing surgery [44]. Pouch function is known to deteriorate in time with increasing age in all patients undergoing IPAA with fecal incontinence. Not surprisingly, this effect may be more pronounced in the elderly [48]. Despite this, elderly patients still report a high level of satisfaction with IPAA, with 89% of elderly UC patients stating that they would opt to undergo the procedure again and 96% willing to recommend it to others [49]. Therefore, careful patient selection and appropriate preoperative counseling regarding expected function make it reasonable to offer IPAA to elderly patients. If undergoing IPAA, it may be best to perform a double-stapled technique compared with a hand-sewn technique with mucosectomy because some studies suggest improved function with a stapled anastomosis.

### Minimally invasive approach

The majority of the literature supports a minimally invasive laparoscopic approach to elderly colorectal surgical patients [50,51]. Short-term outcomes are improved compared with open surgery, and patients have shorter length of hospital stay, require less intensive care, and have lower complications rates compared with open surgery [50–53]. Therefore, every effort should be utilized to offer elderly patients a minimally invasive approach when performing major abdominal surgery for IBD.

## Postoperative considerations

### ERP protocol

Enhanced recovery protocols (ERPs) are multimodal pathways being increasingly utilized among colorectal surgeons to decrease postoperative length of stay and reduce patient morbidity [54]. Reviews of ERP following implementation of proven that decreased fluid use, early mobilization, decreased narcotic use, early drain removal, and early feeding result in early discharge, ambulation, decreased postoperative length of stay, cost, and patient morbidity. In the elderly, specifically, ERP pathways are particularly beneficial. There is some evidence to suggest a greater benefit to elderly patients due to early mobilization, early feeding, and using local anesthesia which can decrease medical complications. Thus, in elderly patients, it may be of most benefit to follow ERP pathways when operating on IBD patients.

### Deep venous thrombus prophylaxis

Finally, thrombotic complications are more common in elderly IBD patients potentially driven by a combination of disease-related hypercoagulability, reduced mobility, and dehydration, all of which are more common in elderly patients than in young IBD patients [55]. In the Nationwide Inpatient Sample Cohort Study, the highest rates of venous thromboembolism were seen in elderly UC patients with a third aged 80 and above experiencing a venous thrombotic complication during hospitalization [4]. Thus, it is of paramount importance to follow deep venous thrombus (DVT) prophylaxis guidelines for the reduction of DVT rates in the perioperative period and consider extended

90-day DVT prophylaxis when the patient is discharged postoperatively, so long as the patient is not already anticoagulated, which is more common in the elderly.

## Conclusions

The combination of an aging population and increasing incidence of IBD implies that the incidence of elderly IBD is on the rise. The relatively limited data on surgical outcomes in the elderly IBD patients and their exclusion from large medical trials make it difficult to understand how to better optimize their care. However, in taking perioperative data in the elderly and combining it with our understanding of IBD in the elderly, we can see that postoperative outcomes may be optimized by reducing polypharmacy and malnutrition, addressing frailty in the preoperative period, using minimally invasive approaches during operations, and assigning enhanced recovery protocol postoperatively. Future research should address specific issues in elderly IBD patients undergoing surgery such as the risk of preoperative exposure to immunosuppression, the need for corticosteroid tapers, the need to address preoperative chronic anemia from ongoing bowel losses, and understanding if there is any role for postoperative prophylaxis.

## Compliance with ethical standards

### Conflict of interest

Amy L. Lightner reports personal fees from Takeda, outside the submitted work.

Miguel Regueiro has received research support from Abbvie, Janssen, Takeda, Pfizer Unrestricted Educational Grants from Abbvie, Janssen, UCB, Pfizer, Takeda, Salix, Shire Advisory Boards and Consultant for Abbvie, Janssen, UCB, Takeda, Pfizer, Miraca Labs, Amgen, Celgene, Seres, Allergan, Genentech, Gilead, Salix, and Prometheus.

Benjamin Click declares that he has no conflict of interest.

### Human and animal rights and informed consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

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