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ECCO Guideline

ECCO Guidelines on Therapeutics in Ulcerative Colitis: Surgical Treatment

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Abstract

This is the second of two articles presenting the European Crohn's and Colitis Organisation [ECCO] evidence-based consensus guidelines on the management of adult patients with ulcerative colitis [UC]. The first article covers the medical management of UC, including acute severe colitis. The present article addresses the surgical management of medically refractory UC, including the general surgical approach and perioperative optimisation, surgical strategies and techniques, and recommended levels of centre expertise and surgical specialisation. Together, these two articles aim to inform shared decision-making and to guide clinicians and healthcare professionals involved in the care of patients with UC, drawing on the best available evidence.

Key words: ulcerative colitis [UC]; inflammatory bowel disease [IBD]; guidelines; surgery; surgical treatment; appendectomy; ileopouchanal anastomosis [IPAA]; ileorectal anastomosis [IRA]

1. Introduction

Ulcerative colitis [UC] is one of two major chronic immune-mediated inflammatory bowel diseases [IBD] that affects patients globally with a rapidly rising prevalence. The incidence of UC across Europe ranges from 1.9 to 17.2 per 100 000 persons/year, with the highest figures in Northern and Western Europe, especially in Scandinavia and the UK. Similarly, the highest prevalence is seen in those regions and ranges from 2.42 patients (Romania) to 505 patients (Norway) per 100 000 persons,[1] while Southern European countries are seeing a rapid increase in prevalence.[2] UC occurs at any age, but it is most frequently diagnosed in the second and third decades of life. No cure is presently available. Hence, treatment focuses on controlling symptoms, improving quality of life [QoL], and preventing or managing complications.

While UC often presents as a mild disease with a relapsing–remitting course, it may evolve into a life-threatening condition, either at presentation or during the course of the disease, despite the many lines of medical treatment available. Epidemiological studies show that within 5 years of diagnosis, one in five patients with UC will require hospitalization, with a colectomy rate of around 10% and a mortality rate of 1%.[3–7]

The two main indications for surgery in adult patients with UC are acute severe ulcerative colitis [ASUC] and medically refractory UC[8–11]; surgical management of neoplasia, either dysplasia or cancer, represents a third surgical indication.

ASUC requires immediate hospitalization and intensive medical treatment. Here, surgery can be life-saving, and it is crucial that patients with ASUC are jointly managed by gastroenterologists and digestive surgeons, starting no later than the day of admission.[12–14] Indeed, the window of opportunity for both medical and surgical treatments is narrow and overlaps; joint management and shared decision-making here may truly save lives.[8,11]

On the other hand, surgery for medically refractory UC is focused on recovery and preservation of QoL, as the patients who fail medical treatment are often physically and psychologically exhausted. These patients deserve early surgical advice to learn about the surgical options and their benefits, consequences, and potential complications. Having the opportunity

to meet a high-volume surgeon with a focus on IBD is part of contemporary good medical practice. For many patients, the indication for surgery represents not only a clinical turning point but also an emotional and identity-defining moment. Fear of stoma, concerns about body image, sexuality, work and social life, and the perception of surgery as a "failure" of medical therapy frequently delay acceptance of surgical options. These psychosocial dimensions should be explicitly addressed early in the disease course. The possibility to discuss experiences with peer patients is another resource that often proves very useful to patients facing a difficult, often irreversible decision.

Expert surgical management should be provided within an interdisciplinary and interprofessional network dedicated to the care of patients with IBD. Such teams typically include specialist gastroenterologists, colorectal surgeons, radiologists, pathologists, dietitians, IBD nurses and stoma therapists, psychologists, and peer support services. Indeed, only a well-informed patient may make an informed decision and actively participate in care delivery.

Whenever a neoplastic lesion is discovered, complexity is again the rule with an oncologic proctocolectomy being the main option and segmental resection or even endoscopic resection of a single dysplastic lesion being further options in carefully selected, well-informed patients.[15]

Lastly, restorative proctectomy implies management and, at times, pouch salvage, which is best achieved in IBD centers with surgical expertise available.[16–18]

The European Crohn's and Colitis Organisation [ECCO] aims to provide a practical, evidence-based guide for the medical and surgical management of adults with UC, developed through an interdisciplinary approach. This article focuses specifically on the surgical management of adult UC, addressing preoperative evaluation and key technical considerations. The statements presented herein complement the recommendations on the medical treatment of adult UC, which are detailed in a separate article and now include the integrated management of ASUC [ECCO Guidelines on Therapeutics in Ulcerative Colitis: Medical Treatment]. Both papers represent updates of the 2022 ECCO guidelines on the management of UC published in 2022.[19,20]

2. Methods

The present ECCO surgical guidelines followed the Grading of Recommendations Assessment, Development, and Evaluation [GRADE] workflow, alongside the Oxford 2011 Levels of Evidence [OCEBM], as previously adopted.[21] These interdisciplinary guidelines were coordinated by two gastroenterologists and two surgeons. The guideline development resulted in two manuscripts. The first focused on medical treatment of UC, including ASUC, and was handled by two working groups [WGs]; the second focused on surgical treatment and was handled by a third WG. The four guideline coordinators and three WG leaders constituted the steering committee and were approved by the ECCO Governing Board, its Guidelines Committee, and the ECCO Surgeons Committee.

The steering committee selected a panel of 42 experts from an open call according to their IBD expertise, scientific background, knowledge of GRADE and OCEBM methodologies, and prior contributions to ECCO projects. Geographic and gender balance were also considered. Additionally, six patients with IBD were selected by the International Federation of Crohn's & Ulcerative Colitis Associations (IFCAA) and participated in the development of these guidelines. The experts were supported by a team of professional methodologists and librarians.

Participants first formulated clinically relevant questions for the surgical treatment of UC using the Population, Intervention, Comparator, Outcomes [PICO] framework. These PICO questions were discussed in teleconferences within the surgical working group and were subsequently finalized at a meeting of the full guideline group held in Vienna in November 2024. Only PICO questions achieving 80% or more agreement among the panel were retained. Next, the panellists ranked the importance of each outcome on a scale from 1 to 9 according to GRADE definitions. Scores of 7-9 indicated outcomes considered critical to patient decision-making; scores of 4-6 indicated outcomes regarded as important but not critical; and scores of 1-3 represented outcomes of limited importance. Agreement among panellists regarding outcome importance was assessed using the Disagreement Index, as described in the RAND/UCLA appropriateness method.[22] Outcomes not considered critical or important were discarded. The perspective of the six patient representatives was essential in the selection of the PICO and final list of outcomes. The list of outcomes and the grading of each outcome are shown in Section 1 of the Supplementary Material available online.

Professional librarians then performed a comprehensive literature search in EMBASE, PubMed/MEDLINE, and the Cochrane Central databases, using specific search strings developed for each PICO question [Section 2 of the Supplementary Material available online]. Only studies published in English were considered. For PICO questions retained from the 2022 guidelines, the same search string was used as in the previous literature search, with the start date of the database queries set to the end search date of the prior guidelines [February 1, 2020]. For all new PICO questions, the search start date was unrestricted. The literature search was made using the best level of evidence hierarchical strategy, where meta-analyses of randomized controlled trials [RCTs] were selected first, and case reports were selected last. Lower levels of evidence were searched only if higher levels of evidence were not found, or if the evidence was newer. The relevance of the retrieved literature according to the PICO at hand was assessed independently by two WG members. Discrepancies were resolved by consensus, by the WG lead and surgical coordinators, or both. The full-text articles were then retrieved for final data extraction and analysis. A literature list is provided in Section 3 of the Supplementary Materials online.

High-quality evidence is often limited in surgical research due to clinical complexity, methodological constraints, and ethical considerations. The steering committee anticipated that applying the GRADE framework to surgical PICOs would frequently yield "insufficient evidence to make a recommendation" despite the high clinical relevance of many questions. Therefore, surgical PICOs followed the same structured process as medical PICOs, namely question formulation, systematic literature search, and study selection, although evidence appraisal and statements were based on the OCEBM.[23,24] This hierarchy enables identification of the strongest available evidence when high-level data are scarce. This methodological adaptation was approved by the ECCO Guidelines Committee and Governing Board.

The evidence related to each outcome was assessed by a WG member, who drafted an initial statement, assigned a level of

evidence based on OCEBM, and wrote a supporting text. Both the type of research and the data quality were considered for the grading of evidence. Statements, levels of evidence, and supporting text were shared among all the WG members and coordinators on a dedicated online platform. Section 4 of the Supplementary Materials available online presents the OCEBM tables for each PICO, including a recommendation, evidence level, and key findings.

The pre-final versions of all recommendations were discussed among panel members during a series of virtual consensus meetings before being put to a vote. All recommendations, both medical and surgical, were then subjected to two rounds of online voting by the full expert panel, ECCO National Representatives, and additional reviewers from among ECCO members who applied to the open call but were not selected [see Acknowledgements]. Comments provided in each voting round were considered for the final wording of statements and supporting text. The final versions of the present guideline statements reached at least 80% agreement among the guideline members. No further change in wording was then allowed. The resulting statements and draft manuscript were critically reviewed by two external Guidelines Committee members and by the ECCO Governing Board, who approved the final version of these guidelines. Of note, all statements should be read in the context of the supporting text that follows. This guideline focuses exclusively on the management of adult patients with UC.

3. General approach to the surgical management of ulcerative colitis

These guidelines present the evidence supporting the use of surgical approaches in the management of UC. They were developed and written based on available data, derived primarily from cohort studies. Contemporary surgical care of a patient with UC requires an interdisciplinary approach and the support of a dietitian and stoma therapist. Empowering patients to decide on their care requires early, comprehensive information on all therapeutic options, including benefits, morbidity, functional outcomes, and perioperative surgical care. Access to specialized IBD centers with medical and surgical IBD experts provides patients with better information and can optimise outcomes.[25,26] Networks of care with ad-hoc referral and co-management may be more amenable in certain healthcare environments as an alternative to centralization of care. At times, ASUC surgical management does not permit a referral to an expert center. Prompt decision on surgery for ASUC is essential and hence joint management between gastroenterology and surgery is mandatory, as recommended in the medical part of the present guidelines [ECCO Guidelines on Therapeutics in Ulcerative Colitis: Medical Treatment]. Indeed, emergency colectomy can be a life-saving procedure, while failure to proceed to timely colectomy is associated with an increased mortality rate, which can reach up to 15% according to an analysis [2007-2013] of a New York state-wide database.[27]

Whenever a restorative proctectomy is indicated, whether for medically refractory UC or for neoplasm, ECCO strongly recommends performance of a minimally invasive proctectomy in a specialized IBD center with a minimal institutional volume of 10 proctectomies with ileal pouch anal anastomoses [IPAAs] yearly.[28] These minimal figures align with the recommendations set by each surgeon for oncologic proctectomy in many healthcare systems. The rationale for this volume threshold is the improved morbidity, pouch failure, and salvage rates and lower resource consumption reported in higher volume, specialized centers.[29–36] Proctectomy or alternatively a close surveillance of the residual rectum is advised when a colectomy has been performed.

A holistic perioperative optimisation strategy, incorporating expert nutritional assessment and support, specialized stoma therapist care, and the involvement of dedicated radiologists, pathologists, and psychologists, contributes to the improved clinical outcomes associated with specialized care.

Functional rehabilitation, including reproductive counseling and pelvic-floor physiotherapy, and urology and obstetric services are further resources that contribute to optimal care and recovery. Indeed, patients with UC are often young and both the patient and society at large benefit from optimal outcomes and a normal life.

The topic of optimal resource utilization has gained central importance. In the context of medically refractory UC, the decision to proceed to surgery should be discussed considering the success rate and cost of persisting with medical therapy, inclusion in a clinical trial, disability or time away from social and professional life associated with poorly controlled UC, and the psychological and physical burden of recurrent flares, inpatient admissions, and repeated exposure to steroids.[37–39]

Contemporary debates in the surgical management of patients with UC center on the extent of resection in neoplastic conditions and in staged restorative proctectomies. Compared with the prior iteration of the ECCO UC guidelines on surgical management,[20] an individualized decision concerning the extent of resection in the presence of a sporadic neoplastic lesion is gaining further attention, although an oncologic proctocolectomy remains the established and safest option.[40] A one-stage restorative proctocolectomy remains unadvised, whereas a three-stage restorative procedure is the conservative standard, when the patient was initially operated for ASUC, is unfit, suffers from proctitis, or combinations thereof.[20] The debate over whether to perform a two-stage or a modified two-stage restorative proctocolectomy in the elective setting remains unresolved, with the literature listing advantages and disadvantages for both approaches.[41,42] The most important point in this context is that a center electing to offer a modified two-stage option must be able to rapidly address an anastomotic leak before pelvic sepsis becomes apparent and long-term function is affected. The future may well see this nomenclature change to include appendectomy as an initial surgical step to reduce recurrence rates and control refractory colitis, as suggested by the recently published ACCURE and COSTA studies.[43,44]

The overarching goal of UC treatment is to preserve health-related QoL and prevent long-term disability.[45] Achieving this requires not only rapid symptom control but also endoscopic healing whenever possible, which is associated with improved long-term outcomes.[46] It is equally essential to offer [and not delay] surgical intervention when it represents an appropriate alternative to further medical escalation. Surgery may be life-saving in ASUC and in the presence of neoplasia, while it preserves QoL in intractable disease.

Although total proctocolectomy provides definitive relief from UC symptoms, it results in permanent loss of colorectal function, an outcome that can be socially and psychologically challenging for patients,[47] particularly when perioperative care is suboptimal or counseling about expectations and functional results is insufficient. Early psychosocial support and

comprehensive preoperative education are therefore crucial components of high-quality surgical care.

When appropriately timed and effectively delivered, surgery can resolve debilitating symptoms and eliminate the need for chronic medical therapy, hospitalizations, recurrent transfusions, and long-term immunosuppression, while also reducing the risk of malignancy. However, optimal surgical strategies must ensure durable functional outcomes, minimize perioperative morbidity, and consider resource utilization.[48] The present guidelines seek to inform and guide decision-making when advising and treating patients with UC amenable to surgical care.

4. Surgical strategy for refractory moderate-to-severe ulcerative colitis

Statement 1

We recommend surgical treatment when moderately-to-severely active UC is refractory to optimised medical therapy [EL3] [Agreement 97.5%]

Surgery in an elective setting could improve outcomes and reduce the risk of emergency surgery and complications [EL4] [Agreement 97.5%]

Despite major advances in medical therapy, colectomy rates in UC have remained largely unchanged,[49] underscoring the ongoing need for surgery in selected patients.

From the patient's perspective, functional outcomes, such as nocturnal bowel movements, urgency, sleep disruption, and the impact on work productivity, travel, and social participation, are often more meaningful than traditional clinical endpoints. These considerations should be addressed explicitly during preoperative counseling. Multidisciplinary team involvement and shared decision-making are essential to ensure that care remains optimal and patient-centered.[50,51] When appropriately indicated and timed, elective colectomy or proctocolectomy can provide durable symptom control and restoration of QoL.[52]

The timing of surgical intervention is a key determinant of outcomes in UC. Evidence shows that early surgery following failure of optimised medical therapy is associated with improved postoperative recovery, reduced morbidity, and better long-term QoL.[50,51,53] Several predictive markers, including elevated C-reactive protein, hypoalbuminemia, and steroid-refractory disease, help identify patients likely to require colectomy and should prompt early referral for surgical assessment.[8,54] Conversely, delaying surgery increases the risk of emergency colectomy, which is associated with higher rates of postoperative complications, prolonged hospitalization, and increased mortality.[50,55,56] Psychosocial factors, such as depression, are also linked to delayed surgical intervention and poorer outcomes.[57]

Statement 2

We suggest minimally invasive surgery for performing colectomy in patients with medically refractory UC [EL3] [Agreement 97.6%]

In patients with medically refractory UC, minimally invasive colectomy [MIC] is the standard approach in expert centers, as it optimises postoperative recovery, preserves fertility, and facilitates future restorative procedures. However, the choice of surgical technique should be individualized based on surgeon expertise, patient comorbidities, and institutional resources. Open colectomy should be reserved for patients in whom minimally invasive surgery [MIS] is not safe or is not technically feasible, with consideration given to referral to centers with appropriate expertise when elective surgery is planned.

High-quality RCTs directly comparing MIC with open colectomy [OC] in UC are currently lacking. Laparoscopic and robotic approaches have been reported as technically feasible;[58–60] such reports have frequently focused on technical aspects or pouch-related procedures rather than direct comparisons between MIC and OC.[61–65] Nonetheless, evidence from meta-analyses and large database studies indicates that MIC is safe, is feasible, and confers clinically relevant benefits, including reduced morbidity, faster recovery and shorter hospital stay, lower rates of adhesions and incisional hernias, improved cosmesis, and superior QoL outcomes.[66–70] Of particular importance, laparoscopic surgery is consistently associated with improved female fecundity, probably due to reduced formation of pelvic adhesions.[71,72] These findings are consistent with ECCO surgical and fertility guidelines, which recommend laparoscopy as the preferred surgical approach in UC and emphasize its potential to reduce infertility risk.[20,73]

Statement 3

We suggest avoiding a short rectal stump below the peritoneal reflection in subtotal colectomy [EL5] [Agreement 100%]

There is a paucity of data regarding the optimal length of the rectal stump following subtotal colectomy, and no randomized trials have been conducted to date. Two small retrospective studies evaluated outcomes associated with short versus long rectosigmoid stumps. The first study reported that short rectal stumps divided below the peritoneal reflection [$n = 9$] were associated with a significantly higher incidence of stump dehiscence compared with stumps divided above the reflection [$n = 53$]. Short stumps were also more frequently associated with technical difficulties during subsequent proctectomy.[74] The second study found no significant differences between short intrapelvic rectal stumps [$n = 25$] and longer stumps exteriorized into the subcutaneous tissue [$n = 35$].[75]

Three main strategies exist for managing the residual rectal stump. These include intra-abdominal closure [Hartmann's pouch], exteriorization as a mucous fistula, or placement of the closed remnant in the subcutaneous tissue. In practice, Hartmann's pouch typically results in a shorter retained rectum than the other approaches. No randomized trials have compared these techniques.

A systematic review of observational studies reported pooled incidences of stump leak, pelvic abscess or sepsis, and wound infection of 4.9%, 5.7%, and 11.3%, respectively. Subcutaneous placement was associated with the highest incidence of stump leak [12.6%], while mucous fistula was associated with the highest rate of wound infection [18.5%]. Stapled or oversewn

Hartmann's pouches were more frequently associated with pelvic abscess or sepsis [11.1%].[76] A Swedish retrospective cohort study found that subcutaneous placement [$n = 144$] did not reduce the risk of severe complications and was associated with significantly higher rates of wound and stoma complications compared with Hartmann's pouch [$n = 157$].[77] Another multicenter cohort study comparing exteriorization of the rectosigmoid stump at the ileostomy site [ileo-sigmoidostomy, $n = 102$] with closed rectal stump [$n = 212$] after laparoscopic subtotal colectomy revealed significantly higher rates of stoma-related complications in the ileo-sigmoidostomy group, although rates of surgical reintervention did not differ. Conversely, patients with ileo-sigmoidostomy were more likely to undergo subsequent pouch surgery laparoscopically.[78]

Taken together, due to the heterogeneity and limitations of the available observational data, no firm recommendation can be made regarding the optimal rectal stump length or management strategy following subtotal colectomy. Nevertheless, a short rectal stump should be avoided given the increased risk of pelvic sepsis and the technical challenges posed during subsequent completion proctectomy, particularly when IPAA is planned. Management decisions should be individualized based on intraoperative findings, patient comorbidities, and surgeon experience, with a clear discussion of the advantages and disadvantages of each approach with the patient.

Statement 4

After initial subtotal colectomy, we suggest patients undergo completion proctectomy with or without reconstruction with IPAA. Alternatively, the rectal stump may be left in situ with endoscopic surveillance [EL3] [Agreement 100%]

Following subtotal colectomy [STC] for UC, patients may proceed to completion proctectomy with IPAA or remain with a permanent end ileostomy, with or without completion proctectomy. Reported rates of restorative versus non-restorative surgery vary widely. A large series from 2009-2021 revealed that approximately 45%-70% of patients ultimately undergo IPAA, while 30%-50% remain with a permanent ileostomy.[79–82] In a study by Chen et al. [2009-2019], 50.2% underwent IPAA, 33% had no further surgery, and 16.8% underwent completion proctectomy with end ileostomy.[80] Similarly, Deyrat et al. [2013-2021] reported that 67% underwent reconstruction (74% IPAA, 26% ileorectal anastomosis [IRA]), while 33% remained with permanent ileostomy.[81] In contrast, Stephens et al. reported that 69% underwent proctectomy and 44% IPAA.[82] Despite declining overall surgical rates for UC, the proportion of patients undergoing pouch reconstruction has remained stable.[79]

QoL following restorative and non-restorative surgery appears comparable, with both approaches associated with high patient satisfaction and durable disease control.[83,84] Consequently, patient-specific factors largely determine the choice between reconstruction and permanent diversion. Predictors of non-restorative surgery include older age, medical comorbidities, neoplasia, diagnostic revision to Crohn's disease, prior open surgery, complications following STC, and treatment at low-volume hospitals.[80–82,85] Age is a particularly influential factor; a study by Stephens et al. among patients aged >65 years revealed that 24% underwent restorative surgery, while 76% underwent non-restorative surgery.[82]

Perioperative morbidity also influences decision-making. Patients undergoing IPAA with a diverting loop ileostomy have higher early readmission rates due to dehydration than non-restored patients [29% vs 4%; $P < .0001$], although long-term rates of acute or chronic renal failure are not increased, and 95% of temporary ileostomies are eventually reversed.[86] In patients with UC and PSC requiring liver transplantation, outcomes following IPAA and end ileostomy are comparable in terms of graft survival, rejection episodes, PSC recurrence, and re-transplantation, although patients with end ileostomy may remain at risk for parastomal varices.[87,88]

In summary, both restorative and non-restorative strategies following STC provide excellent QoL, although rates of IPAA vary across centers and patient populations. Shared decision-making should be individualized, incorporating patient age, comorbidities, diagnosis, neoplasia, perioperative risk, and, critically, patient preferences. For patients in whom the rectal stump is retained, endoscopic surveillance for rectal cancer is an essential component of long-term management.[89]

Statement 5

We suggest that patients with UC and a minimally affected rectum can be offered the option of an IRA, but due to the increased risk of rectal cancer or dysplasia, IPAA remains the gold standard for restoration of gastrointestinal continuity [EL4] [Agreement 100%]

Although IPAA remains the gold standard for restoring intestinal continuity after subtotal colectomy in European guidelines,[20] patients should be fully informed about all available options, including IRA.[90–93] Decision-making in this context should be further individualized [eg, for patients with dysplasia in the resected colon who have higher cancer risk in the remaining rectum[94]]. There is a paucity of data on sexual function, QoL, and the impact of the laparoscopic era on fertility when comparing IRA with other possible alternatives.[90,92,93,95]

IRA may allow avoidance of pelvic dissection, pouch-related complications, or a permanent stoma, even if only temporarily. This consideration may be particularly relevant for younger patients who are pursuing higher education, establishing careers or relationships, or planning a family. Ongoing research, including the ongoing multicenter prospective CRUISE study [Colectomy Reconstruction for Ulcerative colitis In Sweden and England], is expected to provide important comparative data to inform future decision-making.[96]

In the context of restorative proctocolectomy for UC, reconstructive options include IPAA, IRA, and continent ileostomy [Kock pouch]. Each option entails specific risks, benefits, and long-term considerations and should be evaluated considering cancer risk, functional outcomes, and patient values.

IPAA remains the standard of care, with favorable long-term outcomes, particularly when performed in high-volume centers. Lower rates of pouch failure, complications, and reoperations have been observed when surgery is undertaken by experienced colorectal teams.[97]

Statement 6

In patients with UC requiring colectomy, we suggest that reconstructive options should be selected based on cancer risk, functional outcomes, and patient preferences. While IPAA remains the standard of care [EL3], IRA is an option for selected patients. IRA may be associated with improved functional and fertility outcomes but requires endoscopic surveillance and probably medical treatment [EL3]. The continent ileostomy [Kock pouch] is a valid option in patients with a failed IPAA, contraindications to IPAA, or those who prefer it [EL4] [Agreement 100%]

IRA may be appropriate for selected patients, especially those with minimal rectal inflammation and a strong desire to preserve fertility or optimise continence. Comparative studies[98] and meta-analyses[94] have demonstrated improved functional outcomes with IRA, with up to 66% of patients reporting high QoL.[80,84] These findings were confirmed in a 2019 systematic review.[99] IRA is also associated with a lower risk of infertility when compared with IPAA in both men and women.[100,101]

The principal limitation of IRA is the increased risk of rectal cancer and its intrinsic failure rate.

A Swedish cohort study[102] and a 2016 meta-analysis[103] reported higher rates of rectal cancer following IRA [2.4%] compared with IPAA [0.5%], with an odds ratio [OR] of 6.4 for colorectal cancer in the retained rectum. Nevertheless, favorable outcomes may be achieved with rigorous endoscopic surveillance.[104,105] In patients with PSC, the likelihood of undergoing restorative surgery, as well as functional outcomes and failure rates following IRA or IPAA, appear broadly comparable.[106] However, a 6-fold higher risk of rectal cancer was reported in patients with PSC undergoing IRA compared with those without PSC.[102]

Long-term failure rates of IRA are higher than those of IPAA. A French multicenter study reported IRA failure rates of 27% and 40% at 10 and 20 years, respectively, with prior immunosuppressive therapy identified as a key risk factor.[107] Similar findings were reported in a systematic review,[93] and other studies have confirmed higher long-term failure rates compared with IPAA.[108]

Continent ileostomy [Kock pouch] is much less frequently performed but remains a viable option to conventional restorative proctectomy in selected circumstances, particularly after failed IPAA or when IPAA is contraindicated. In a Swedish registry study, 74% of 727 patients required reoperation over a median follow-up of 27 years, and 11% ultimately required pouch excision.[109] Another study reported high patient satisfaction [84%] and QoL outcomes comparable with the general population.[110] Conversion from failed IPAA to Kock pouch has shown outcomes similar to primary Kock pouch construction, supporting its role as a salvage procedure.[111,112] Compared with IPAA, the Kock pouch is a technically more demanding procedure associated with higher complication, reoperation, and failure rates. Indeed, the Kock pouch requires dedicated surgical expertise and follow-up and a motivated, well-informed patient who accepts regular catheterizations to empty the pouch and the likelihood of repeat procedures to restore function. Indeed, a systematic review reported high reoperation rates [20.8%-65%], mostly due to valve failure.[113]

Overall, shared decision-making is essential and should incorporate disease phenotype, cancer risk, functional priorities [continence and fertility], and patient preferences. Individualized planning in specialized centers, with comprehensive counseling regarding risks, benefits, and long-term follow-up requirements, is recommended to optimise outcomes.

Statement 7

We suggest an oncologic proctocolectomy, with or without pouch formation, as the optimal surgical intervention for UC when colorectal cancer or dysplasia is present [EL4] [Agreement 100%]

A sporadic dysplastic lesion, defined by the absence of dysplastic field change in the surrounding or remaining bowel, may be managed with endoscopic resection and surveillance, provided complete en bloc excision is feasible and ongoing surveillance is possible.[40]

In highly selected patients with cancer, such as women wishing to preserve fertility, elderly or frail patients, or those with metastatic disease, limited oncologic resection, including ileorectostomy, may be considered.[114] In such cases, the cancer should be very probably sporadic, with mild or quiescent inflammation in the remaining bowel. Meta-analyses and systematic reviews of retrospective studies have not demonstrated clear differences in postoperative outcomes between segmental resection and total proctocolectomy.[15,115] However, due to the high risk of bias and low quality of evidence, equivalence between these strategies cannot be assumed, and erring on the side of an oncologic proctocolectomy is clearly advised.

Pouch formation may be contraindicated in cases of rectal cancer treated with chemoradiotherapy, as postoperative function is often poor. In addition, pouch construction may not be technically feasible following oncologic proctocolectomy with high ligation of the ileocolic vessels. For guidance on pouch formation in patients with dysplasia or cancer and PSC-associated UC, see the statement 20 and its supporting text at the end of the present guidelines.

Statement 8

We suggest laparoscopic appendectomy is an option for selected patients with therapy-refractory UC [EL3] [Agreement 100%]

The role of the appendix in UC has garnered increasing interest since the first case-control study in 1987 demonstrated an inverse association between prior appendectomy and UC development.[116] More recently, appendectomy has been explored as a potential therapeutic intervention in adults with therapy-refractory UC. Evidence from systematic reviews and prospective cohort studies suggests that appendectomy may induce clinical and endoscopic improvement and may delay or obviate the need for colectomy in a subset of patients.[117–122]

One systematic review reported that appendectomy prior to UC onset was associated with a lower relapse rate compared

with non-appendectomized controls [57.1% vs 78.6%, absolute risk reduction 21.5%; 95% CI 1.71-45.92].[117]

Another meta-analysis suggested a potential reduction in disease activity following appendectomy in selected patients. Among prospective cohorts, the Dutch PASSION study[119] demonstrated that nearly half of the 28 patients initially referred for proctocolectomy achieved clinical response [46.4%] or endoscopic remission [17.8%] at 12 months after appendectomy, while 32.1% required colectomy during that period.[119] Long-term follow-up [median 8 years] showed sustained benefit in approximately one-third of patients, with colectomy rates remaining similar [36%].[120] Therapeutic benefit appears more likely in younger patients and in patients with proctitis or left-sided colitis than in those with extensive disease.[118,119,121,123]

Although no increased colorectal cancer risk has been observed in these cohorts, other studies have reported an increased risk of dysplasia and colorectal cancer in appendectomized patients.[124,125] Therefore, continued endoscopic surveillance remains essential when the colon is preserved.[118,122]

The ACCURE trial[43] provided the first randomized controlled evidence in a related population, namely patients in remission without biologic therapy but with a recent flare. This pragmatic, international RCT demonstrated that elective laparoscopic appendectomy combined with standard medical therapy significantly reduced 1-year relapse rates compared with standard therapy alone [36% vs 56%; risk ratio: 0.65; 95% CI: 0.47-0.89], without an increase in serious adverse events. While not directly addressing therapy-refractory disease, these findings support a possible disease-modifying role for appendectomy in selected patients. Thus, appendectomy combined with standard medical therapy may be offered to UC patients in remission as a safe strategy to reduce the risk of relapse.

The recently completed COSTA study provides comparative data in biologic-exposed patients with active UC refractory to advanced medical therapy.[44] In this multicenter, patient-preference interventional cohort, clinical remission at 12 months was achieved in 32.8% of patients undergoing laparoscopic appendectomy compared with 12.2% of those who switched to a Janus kinase inhibitor [difference 20.6 percentage points; 95% CI: 6.1-35.1; $P = .01$]. Endoscopic response was also higher in the appendectomy group [48.4% vs 25.6%; $P = .018$], with a low complication rate [4% minor complications]. Although confirmation in randomized trials is required, these findings suggest a potential disease-modifying effect of appendectomy in biologic-exposed UC.

In clinical practice, appendectomy should be considered in selected patients with moderate-to-severe UC refractory to biologics or small-molecule therapies. Appendectomy is also a safe strategy in patients on continued standard medical therapy to reduce relapse rate. The surgical technique used in the PASSION, ACCURE, and COSTA trials, and recommended herein, is as follows: laparoscopic appendectomy with resection of the appendiceal orifice together with the caecal base and any periappendicular red patch using a laparoscopic endostapler. Care should be taken to avoid creating stapler-induced stenosis of the ileocaecal junction.

Given the limited and predominantly observational evidence base, decisions should be made within a multidisciplinary framework in specialized centers and should explicitly incorporate patient values and preferences. Where possible, appendectomy should be offered with inclusion in a clinical registry and supported by structured long-term follow-up.

5. Perioperative optimisation

Statement 9

We suggest optimising nutrition preoperatively, as this has an impact on postoperative outcomes in IBD [EL5] [Agreement 97.5%]

Routine enteral or parenteral nutrition is not supported [EL5] [Agreement 97.5%]

Preoperative risk assessment in patients with UC should include a systematic evaluation of nutritional status and body composition, as both are important predictors of postoperative outcomes. Protein-energy malnutrition and sarcopenia are independently associated with an increased risk of postoperative infections, wound complications, and prolonged hospitalization.[126,127] In a cohort of 3008 patients with IBD, 23%-54% of patients experienced >10% weight loss in the 6 months preceding surgery, while hypoalbuminemia was associated with a longer length of hospital stay [OR: 1.66; 95% CI: 1.27-2.18].[8] Despite limited evidence from interventional trials, expert consensus supports routine nutritional screening and individualized correction of identified deficits.[127] In contrast, obesity (body mass index [BMI] > 30 kg/m^2) does not appear to significantly increase the risk of septic or overall postoperative complications [OR: 1.11 and 1.08, respectively], although it may be associated with increased operative complexity and a modestly prolonged length of stay [mean difference: 0.36 days; 95% CI: 0.04-0.69].[128] ECCO published in 2025 a consensus on dietary management of IBD that reviews and advises on nutritional assessment and treatment.

Statement 10

We recommend tapering corticosteroids to <20 mg before elective proctectomy or restorative surgery [EL4] [Agreement 94.6%]

We suggest that biologics [EL4] and small molecules [EL5] probably do not need to be stopped preoperatively taking into account the dosing interval [Agreement 94.6%]

Chronic exposure to corticosteroids has consistently been associated with an increased risk of surgical-site infections [SSIs], including sepsis and anastomotic dehiscence. Higher doses of systemic corticosteroids (≥20 mg prednisolone or equivalent for 4 weeks and more) at the time of restorative proctectomy or proctocolectomy are associated with an increased risk of SSI. Available evidence supports a tapering strategy, with the aim of discontinuation at least 30 days prior to elective surgery whenever clinically feasible.[129–131]

Interpretation of the available data on biologics is complicated by the fact that most studies have pooled all UC-related surgical procedures when analyzing postoperative complications, potentially underestimating the impact of biologics on outcomes following restorative surgery, particularly pouch formation. In the PUCCINI trial, <30% of patients

underwent restorative surgery, limiting the applicability of its findings to pouch-related complications.[132] While anti-TNF and anti-integrin therapies may be continued safely in the preoperative period,[131–133] evidence regarding small-molecule therapies remains insufficient to provide definitive perioperative recommendations. A pragmatic approach is to schedule surgery at the end of the dosing interval of biologics to minimize any potential impact of these agents on perioperative complications. Janus kinase inhibitors (tofacitinib, upadacitinib) should be withheld for 3 days prior to surgery, in accordance with American College of Rheumatology/American Association of Hip and Knee Surgeons perioperative management guidelines.[134,135] Selective sphingosine-1-phosphate receptor modulators (odazinomod, etrasimod) have demonstrated low rates of serious infection,[136] yet lymphocyte suppression persists for several weeks after discontinuation. Hence, perioperative management should be individualized, taking into account the type of surgery, infection risk, and underlying disease activity.

In summary, individualized preoperative optimisation, particularly addressing nutritional deficiencies, frailty, and immunosuppressive exposure, remains essential to reduce operative risk in patients with UC.

Statement 11

We recommend in-hospital thromboembolic prophylaxis for patients with UC undergoing surgery [EL3]. We suggest extended-duration thromboembolic prophylaxis [approximately 4 weeks post-discharge] should be considered for high-risk patients after surgery [EL4] [Agreement 95.3%]

Patients with active UC undergoing surgery are at substantially increased risk of postoperative venous thromboembolism [VTE]. The reported incidence following colonic resection ranges from 0.6% to 8.9%, with most events occurring within the first 2-4 weeks postoperatively.[134] Population-based data demonstrate that surgical patients with UC have a significantly higher risk of VTE than controls [hazard ratio: 1.78; 95% CI: 1.41-2.24], with this increased risk persisting for up to 6 weeks following hospital discharge.[135]

A large US cohort study reported a 90-day post-discharge VTE rate of 5.8% among patients with UC,[135] and prospective studies have shown evidence of persistent hypercoagulability for up to 8-12 weeks postoperatively.[136] A recent multicenter study has further refined risk stratification in this population. Identified risk factors for post-discharge VTE included older age, corticosteroid use [OR: 1.91; 95% CI: 1.37-2.66], obesity [BMI ≥ 35 kg/m^2; OR: 2.34; 95% CI: 1.49-3.67], and postoperative complications, such as anastomotic leak [OR: 2.24; 95% CI: 1.31-3.83] or ileus [OR: 2.60; 95% CI: 1.91-3.54].[137] The most recent meta-analysis included 123 studies with over 23 million patients. The strongest predictors of VTE were prior VTE [OR: 4.44; 95% CI: 2.63-7.49], surgical complications [OR: 3.06; 95% CI: 2.48-3.77], urgent surgery [OR: 2.33; 95% CI: 1.62-3.35], blood transfusions [OR: 2.68; 95% CI: 1.17-6.12], hypoalbuminemia [OR 2.25; 95% CI: 1.93-2.62], and total parenteral nutrition [OR, 2.21; 95% CI: 1.85-2.64]. Treatment with corticosteroids [OR: 1.60; 95% CI: 1.46-1.76] but not anti-TNF-α agents [OR: 0.66; 95% CI: 0.46-0.97] were associated with an increased risk of VTE.[138]

Despite these findings, evidence supporting routine extended-duration prophylaxis for all surgical patients with UC remains limited, and most VTE events still occur during hospitalization despite standard in-hospital thromboprophylaxis.[139]

Accordingly, in-hospital pharmacological prophylaxis is strongly recommended.[140,141] Extended-duration prophylaxis for 4 weeks post-discharge may be considered for high-risk patients (major abdominal or pelvic surgery, active UC, systemic corticosteroid therapy, prior VTE, malignancy, or reduced mobility), with careful consideration of bleeding risk and patient preferences.[140,141] There is currently insufficient evidence to support universal extended prophylaxis, as RCTs are lacking. Therefore, an individualized, risk-based approach is recommended, and clinical judgement is required when determining the appropriateness of extended prophylaxis[136,142] after discharge. For routine post-surgical prophylaxis, low-molecular-weight heparin is preferred over direct oral anticoagulants because of the limited evidence base and concerns regarding drug absorption in this patient population.

6. Restorative proctectomy

Statement 12

We recommend minimally invasive [laparoscopic or robotic] IPAA as the preferred approach [EL3] [Agreement 97.4%]

Current evidence, derived mainly from systematic reviews and cohort studies, indicates that minimally invasive approaches, both laparoscopic and robotic, are safe and effective for IPAA in adults with medically refractory UC.[58,60,143–154]

Across studies, rates of SSI are similar or lower with MIS compared with open surgery [robotic vs open;[143,146] laparoscopic vs open[144,150,154]]. Lower rates have been reported when robotic, laparoscopic, and open approaches are directly compared.[151] Superficial SSI rates are consistently lower with MIS.[147] Reported SSI rates were 1.8% for laparoscopic, 3.6% for robotic, and 4.7% for open procedures.[145] Overall postoperative morbidity is comparable or reduced with MIS. MIS proctectomy with IPAA is also generally associated with shorter hospital stay and faster recovery of bowel function in many studies,[143,145–149,152] although some report no significant differences compared with open surgery.[144,150,154]

Laparoscopic IPAA is associated with lower overall complication rates,[144,145,150–152,154] reduced rates of postoperative ileus,[144,151,154] and fewer septic complications[151] compared with open surgery. While some series have reported higher overall complication rates with robotic IPAA, rates of severe complications, such as anastomotic leak or sepsis, are similar to or lower than those observed with open surgery [robotic 9%;

laparoscopic 3%].[143,146] Although robotic IPAA is often associated with longer operative times and higher in-hospital costs, short-term outcomes and functional results are comparable with those of laparoscopic and open approaches.[58–60] Conversely, open surgery has been identified as an independent risk factor for increased morbidity [OR: 5.4; 95% CI: 1.4-20.5; $P = .014$].[144] No significant differences between surgical approaches have been demonstrated for 30-day mortality,[143–147,150,151,154] reoperation rates,[144,145,151,152] pouch failure,[148,150] continence, bowel-movement frequency, or QoL.[152]

Evidence regarding fertility outcomes after restorative proctocolectomy is mixed. Early small studies suggested that laparoscopic surgery reduces postoperative adhesions and may improve female fecundity compared with an open procedure.[71,72,155] However, larger cohort studies have not confirmed this association and report comparable fertility rates between open and minimally invasive approaches.[101,156] Male fertility and sexual function may also be affected following IPAA, due largely to pelvic-nerve injury rather than the surgical approach itself. A full laparoscopic approach is associated with higher pregnancy rates and reduced need for adhesiolysis during subsequent abdominal surgery. Consequently, laparoscopic restorative proctectomy with IPAA should be considered, particularly in women of reproductive age.

Despite the absence of RCTs, the consistency of available evidence supports MIS for IPAA, provided there is appropriate patient selection, surgical expertise, and timely intervention. Importantly, preference for a minimally invasive approach should not delay surgery when urgent operative management is required, with consideration given to referral to centers with appropriate expertise when elective surgery is planned.

Statement 13

Close rectal dissection may offer advantages over total mesorectal excision, particularly in reducing complications and improving short-term outcomes. We suggest individualizing the choice between close rectal dissection and total mesorectal excision, considering surgeon expertise, patient characteristics, and institutional experience [EL2] [Agreement 100%]

During IPAA surgery for UC without neoplasia, rectal dissection may be performed using either close rectal dissection [CRD] or the total mesorectal excision [TME] plane. CRD involves dissection through a non-anatomical, peri-muscular plane close to the muscularis propria of the rectum.[157] This technique aims to preserve autonomic nerve function but is technically more demanding than TME due to increased bleeding and the challenges of operating outside embryological planes. TME, by contrast, is performed within an avascular anatomical plane but carries a higher risk of autonomic nerve injury.

An RCT including 59 patients [CRD: $n = 28$; TME: $n = 31$] demonstrated that CRD was associated with a lower rate of severe complications and improved short-term QoL compared with TME. Thirty-day morbidity and QoL were assessed using the SF-36, GIQLI, and COREFO questionnaires. The authors postulated that the lower leak rate observed with CRD may be related to sealing of a small posterior defect, thereby reducing dead space behind the pouch and the risk of presacral abscess formation.[157]

Levic et al. described a CRD-based technique involving division of all vessels between the superior rectal vessels, middle rectal vessels, and the rectal wall to expose the longitudinal muscle fibers of the rectum.[158] This approach facilitates posterior and lateral dissection while maintaining close proximity to the rectal wall down to the pelvic floor. A stapled pouch is then created through the ileostomy site before proceeding with the perineal phase of the procedure, which includes a transanal approach. Although this study did not directly compare CRD with TME, the authors favored CRD based on technical and theoretical advantages.

A further single-center retrospective study of 289 patients with a median follow-up exceeding 7 years found no significant differences in most long-term outcomes between CRD and TME.[159] However, a lower incidence of chronic pouch failure due to septic complications was observed in the CRD group than in the [sub]TME group [0.8% vs 6.2%]. This supports the hypothesis that preservation of mesorectal fat may reduce postoperative pelvic sepsis by minimizing dead space while maintaining lymphatic and neural integrity. These findings may be confounded by the higher proportion of CRD patients undergoing transanal minimally invasive proctectomy combined with laparoscopic abdominal surgery.[159]

More recently, the MIRACLE collaborative study, which included six tertiary IBD centers across four European countries, reported that pouch construction in high-volume centers and proctectomy performed using CRD were significant predictors of intermediate-term stoma-free survival.[160]

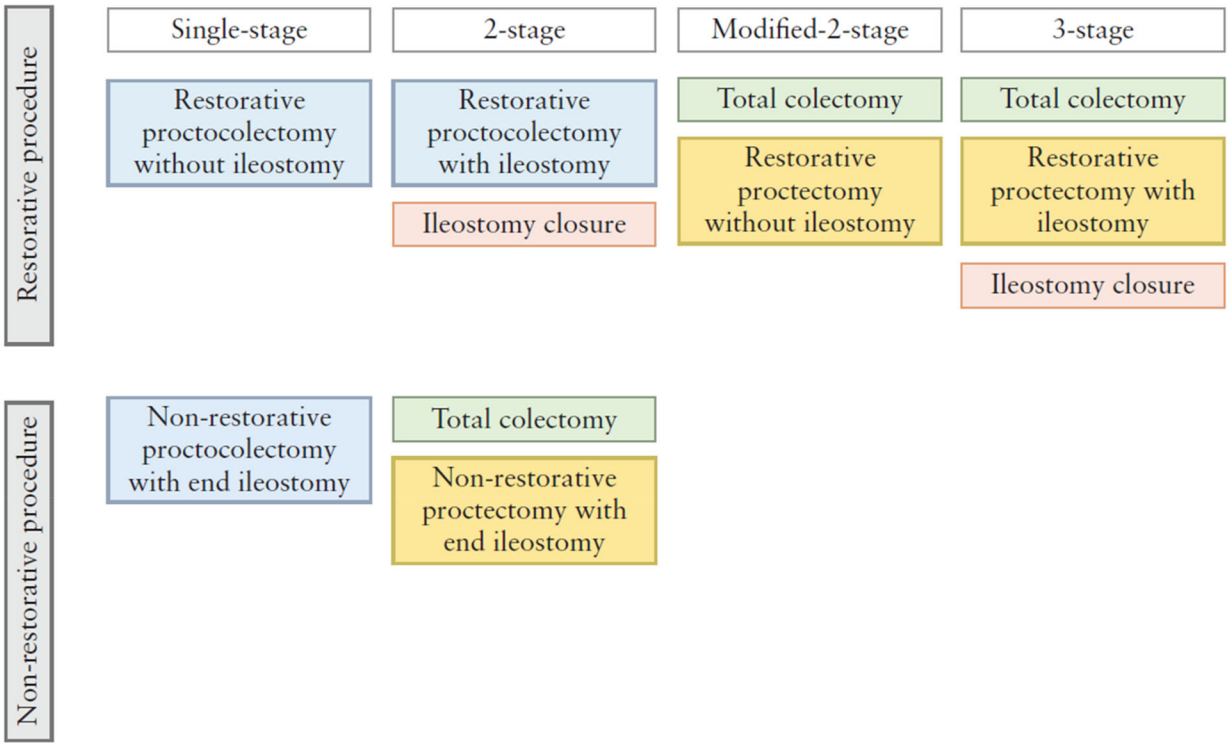
A novel "near-TME" technique has been proposed, which seeks to combine the advantages of CRD and TME by reducing autonomic nerve injury while limiting residual mesorectal tissue; however, robust outcome data are not yet available.[161,162]

Altogether, current evidence supports the use of CRD in patients without neoplasia, although the data remain inconclusive. Surgical approaches should therefore be individualized.

Statement 14

We suggest 3-stage, classical 2-stage, and modified 2-stage IPAA all as valid surgical options depending on patient selection, as they show comparable overall complication rates [EL3] [Agreement 100%]

IPAA may be performed as a one-, two-, or three-stage procedure, preferably using a minimally invasive approach [Figure 1]. The modified two-stage procedure consists of subtotal colectomy followed by proctectomy with pouch construction without creation of a diverting ileostomy. The only available meta-analysis included 10 observational studies with 1727 patients [38% modified two-stage] and demonstrated comparable overall complication rates between the modified two-stage and traditional restorative



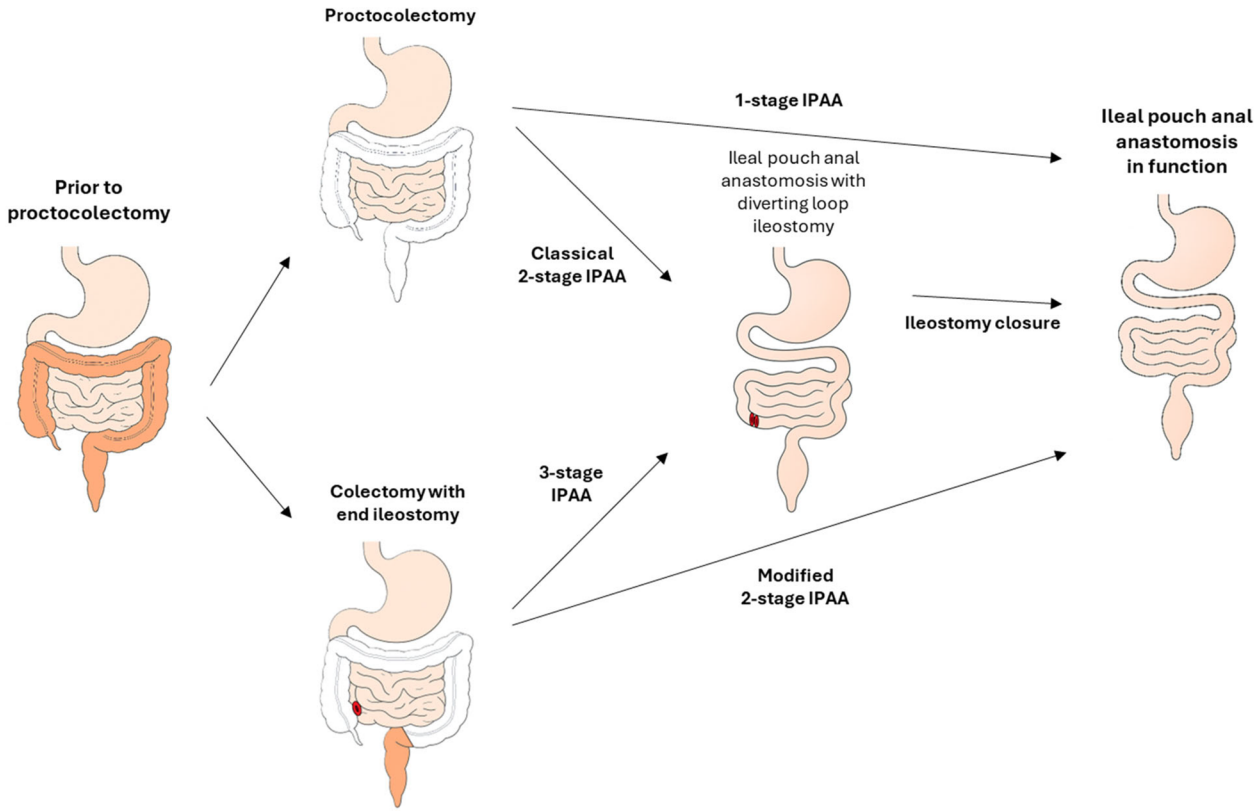


Figure 1. Staged procedures for restorative proctocolectomy. In one-stage surgery, proctocolectomy and ileal pouch anal anastomosis [IPAA] are performed in a single operation without construction of a diverting loop ileostomy. In classical two-stage surgery, proctocolectomy and IPAA are performed simultaneously with creation of a diverting loop ileostomy, which is subsequently closed. In modified two-stage surgery, subtotal colectomy with end ileostomy is performed as the initial procedure, followed by completion proctectomy with IPAA at a later stage, without a diverting loop ileostomy. In three-stage surgery, the initial step consists of subtotal colectomy with end ileostomy, followed by completion proctectomy with IPAA and construction of a diverting loop ileostomy, which is closed during a subsequent operation. Published with permission from the Authors. © The Authors

proctocolectomy approaches in both adult and pediatric populations.[163]

In adult cohorts with lower rates of preoperative biologic exposure, modified two-stage procedures were associated with lower leak rates than classical two-stage approaches [$P < .001$] but not when compared with three-stage procedures. No difference in leak rates was observed between modified two-stage and three-stage approaches in adult patients. The modified two-stage approach was associated with shorter hospital length of stay, although hernia formation rates were significantly higher in this group.[163] More recent large retrospective studies largely confirm these findings.[164–166]

However, several studies reported a trend towards higher anastomotic leak rates with the modified two-stage approach compared with the three-stage approach, with one study demonstrating a statistically significant difference.[167] Among pediatric patients, modified two-stage procedures were associated with higher anastomotic leak rates compared with three-stage approaches [$P = .03$].

These findings highlight the importance of close postoperative monitoring following modified two-stage IPAA to allow for early detection and management of leaks, thereby achieving long-term outcomes comparable with strategies incorporating a diverting ileostomy.[168]

Some studies also suggest lower rates of small-bowel obstruction with the modified two-stage approach compared with classical two-stage or three-stage procedures. Overall hospital length of stay is generally shorter with the modified two-stage approach than with the three-stage procedure.[163]

Given the paucity of RCTs and the high likelihood of selection bias in available observational studies, no definitive recommendation can be made regarding the superiority of one staging strategy over another.

Statement 15

We suggest the ileal J-pouch as the optimal configuration [EL3], which should be around 15 cm in length and tension free [EL5] [Agreement 100%]

The theoretical functional advantages of S-, W-, and K-pouch configurations, related to their greater reservoir volume,[169–171] appear to be limited to the short term.[170,172–174] Patients with S-pouches are more likely to experience pouch-related complications and pouch failure.[175] Nevertheless, when mesenteric length is limited and reach to the anus is compromised, an S-pouch may be preferable. The J-pouch, however, offers more consistent functional outcomes[174] and is easier to construct and teach, supporting its status as the preferred pouch configuration[176,177]

By convention, ileal J-pouches are typically 15-20 cm in length.[178] Longer pouches are associated with increased pouch volume and reduced stool frequency,[179,180] whereas shorter pouches are linked to inferior QoL and increased pouchitis rates.[181] Conflicting evidence exists, with some studies reporting higher SF-36 scores and lower Öresland scores in patients with shorter pouches.[182] Importantly, creation of a tension-free pouch is the most critical determinant of outcome, and the most dependent, tension-free loop of ileum should be selected as the pouch apex rather than adhering rigidly to a predetermined length.

In summary, due to its reproducibility, technical efficiency, and favorable long-term functional outcomes, the ileal J-pouch remains the preferred pouch configuration.

Statement 16

We suggest that the length of the rectal cuff or retained rectum be kept up to 2 cm, as longer cuffs may increase the risk of inflammation [cuffitis], dysplasia, or both [EL5] [Agreement 100%]

When performing IPAA with a stapled anastomosis, it is generally recommended that the rectal cuff be limited to ≤2 cm. This approach preserves the anal transition zone and associated sensory function, thereby supporting continence, while minimizing the risks of cuffitis, dysplasia, or malignancy arising from retained rectal mucosa. Evidence directly assessing optimal cuff length is limited, and current practice is largely guided by expert consensus.

One retrospective cohort study, including 165 patients, compared outcomes between 25 patients with a long cuff and 138 patients with a short cuff.[183] At 1 year postoperatively, bowel function was similar between groups, with no significant differences in stool frequency, nocturnal defecation, or soiling. Rates of cuffitis, pouchitis, and cuff-related neoplasia were also comparable. Although current data do not demonstrate a clear functional or oncologic disadvantage associated with a longer cuff, the low quality of evidence and potential long-term risks support maintaining a cuff length of ≤2 cm in routine practice.[16]

Statement 17

IPAA can be constructed using either a stapled or a handsewn anastomosis. Given the higher risk of minor incontinence or seepage with the handsewn approach, we suggest using the stapled technique in suitable patients [EL3] [Agreement 100%]

Both stapled and handsewn techniques are acceptable options for IPAA. The stapled approach preserves a short rectal cuff [ideally ≤2 cm], maintaining the anal transition zone and its sensory contribution to continence. However, retained rectal mucosa may be associated with cuffitis and, rarely, dysplasia or carcinoma. The handsewn technique, typically combined with mucosectomy, removes the rectal cuff and is therefore generally reserved for patients with rectal dysplasia or those undergoing redo pouch surgery. Available evidence does not demonstrate a clear difference in postoperative septic complications or anastomotic leak rates between stapled and handsewn IPAA. The largest systematic review to date including 8872 patients reported comparable leak rates between techniques.[184] One retrospective study revealed higher leak rates following a transanal approach, the majority of which involved handsewn anastomosis, suggesting that technical factors rather than

anastomotic type may have influenced outcomes.[29] Hospital length of stay appears similar between approaches, although data are limited due to underreporting.[184]

Anastomotic strictures occur more frequently following handsewn IPAA and this approach is also associated with a higher risk of small-bowel obstruction.[149,184] Despite anatomical differences in cuff preservation, long-term rates of cuffitis do not differ significantly between stapled and handsewn techniques.[184]

Evidence regarding pouch failure is mixed. Several single-center cohort studies found no significant association between anastomotic technique and pouch failure,[17,30–32] whereas other studies reported higher failure rates with handsewn IPAA, either on univariable analysis or in systematic reviews.[33,184]

Functional outcomes are consistently superior following stapled IPAA, with lower rates of seepage and minor incontinence and reduced pad usage.[33,34,184] Anal manometry studies demonstrate recovery of maximum resting pressure by 12 months in stapled IPAA, while pressures remain lower after handsewn anastomosis.[184,185] Maximum squeeze pressure is also better preserved following stapled IPAA.[185] Defecatory disorders, defined by Wexner scores ≥13 or Kirwan scores ≥2, occur less frequently in patients with stapled anastomoses.[34] One retrospective study reported a higher incidence of dysplasia or carcinoma in the preserved anal transition zone following stapled IPAA, although such events remain rare.[31]

7. Experience and specialization

Statement 18

We recommend that reconstructive surgery after colectomy for UC with IPAA should be performed in specialized centers by experienced surgeons [EL4] [Agreement 97.5%]

Outcomes following IPAA are consistently superior in high-volume centers that provide an interdisciplinary, holistic approach. A systematic review[35] and multiple individual series[36,186,187] demonstrated lower rates of pouch failure or pouch excision in such settings. Retrospective cohort studies further report fewer reoperations,[186] shorter length of hospital stay,[36] and reduced readmission rates[188,189] in high-volume centers. Although definitions vary, a minimum institutional volume of eight IPAA procedures per year has been proposed as a threshold for improved outcomes,[36] whereas ECCO set the desirable institutional volume at 10 IPAA procedures yearly in a recent position paper on Quality of Care Standards in Inflammatory Bowel Diseases.[28]

Similarly, higher individual surgeon volume is associated with better results. Retrospective cohort studies report lower rates of pouch failure,[190] fewer perioperative complications,[190,191] and shorter hospital stay[36] when surgery is performed by high-volume surgeons. Definitions of high surgeon volume vary across studies, ranging from more than 50 procedures[190] to more than 150 procedures over a surgeon's career,[191] or more than 3.6 procedures per surgeon per year.[36]

Overall, pouch failure occurs in approximately 5%-10% of patients following IPAA.[16] Failure may result from mechanical or inflammatory complications, including strictures, septic complications [leaks and fistulae], pouch volvulus, and cuffitis. Reported incidences vary widely; strictures occur in 5%-38% of cases [most commonly at the pouch–anal anastomosis or pouch inlet], fistulae in 1.5%-25%, volvulus in approximately 0.2%, and cuffitis in 10%-30%.[192–195] ECCO published in 2025 a topical review on pouch disorders that reviews and advises on diagnostic and treatment approaches.[16]

Statement 19

We suggest that early recognition and stepwise medical, endoscopic, and surgical management of pouch complications may delay or prevent pouch failure. Collaboration with experienced centers is essential [EL5] [Agreement 97.2%]

Initial management is usually conservative and stepwise, involving local surgical or endoscopic interventions. Endoscopic approaches include clipping or presacral sinusotomy for leaks, and balloon dilatation or stricturotomy for strictures. These strategies achieve moderate success rates, although up to 15% of patients ultimately require abdominal surgery.[196–198] Local treatments for pouch fistulae and septic complications, such as advancement flaps or autologous tissue grafts, have limited success but are frequently attempted before proceeding to abdominal surgery.[193,199–201] Pouch volvulus may be temporarily managed with endoscopic detorsion but typically requires definitive surgical pexy, while cuffitis is managed with topical therapies or advanced medical treatment in refractory cases.[195] In patients with refractory complications, temporary diversion may complement local repair and is often necessary prior to transabdominal pouch revision or excision.[202]

Redo pouch surgery may be offered to selected patients in high-volume centers. Although functional outcomes are generally inferior to those following primary IPAA, symptom improvement can still be achieved. Established risk factors for pouch failure include pelvic sepsis [hazard ratio: 3.7; $P < .0001$] and Crohn's disease [OR: 3.9; 95% CI: 1.1-15.9].[187] Pouch excision is a complex, high-risk procedure, with reported complication rates of 18%-63% (most commonly due to presacral sinus formation [9%-40%]) and mortality rates of 0.6%-1.4%. Both pouch revision and excision are associated with a risk of sexual and urinary dysfunction.[203]

Pouch-related adenocarcinoma is rare, with an estimated incidence of 0.33%-0.35% over 20-50 years following UC diagnosis and <0.02% after 20 years following IPAA. Tumors most commonly arise in the rectal cuff or pouch body. Identified risk factors include neoplasia in the colectomy specimen and absence of mucosectomy. Abdominoperineal pouch excision is recommended for the treatment of pouch-related adenocarcinoma.[204]

Statement 20

We suggest reconstruction with an ileal pouch anal anastomosis as a safe option in patients with PSC [EL 2]. Reconstruction with an ileorectal anastomosis carries a higher risk of developing cancer in the remaining rectum, when compared to patients without PSC or those who underwent reconstruction with ileal pouch anal anastomosis [EL 4] [Agreement 97.2%]

Patients with PSC undergoing IPAA have an increased risk of acute and chronic pouchitis compared with patients without PSC, as demonstrated in a recent meta-analysis[205] and a recent review.[206] However, PSC has not been identified as a risk factor for IPAA failure.[207–210]

PSC is associated with an increased risk of neoplasia following IPAA in univariate analyses,[211] but this association was not confirmed in multivariate analyses.[95,206] In these studies, neoplasia of the pouch body and of the anorectal cuff were not analyzed separately. Conversely, colectomy followed by reconstruction with an IRA in patients with PSC appears to carry a higher risk of cancer development in the residual rectum compared with proctocolectomy and IPAA.[102] This risk may be mitigated in patients without neoplasia in the resection specimen. Accordingly, some authors suggest that selected patients in whom the rectum is preserved and no dysplasia is present may be considered for IRA following thorough counseling.[106,212]

A systematic review found no evidence that proctocolectomy with IPAA influences the course of PSC and no correlation was observed between the severity or course of PSC and pouchitis, suggesting that the two conditions progress independently.[206] Data are inconclusive regarding the influence of reconstruction type on graft survival following orthotopic liver transplantation [OLT] for PSC. However, the presence of colon in situ at the time of OLT or active colitis following OLT in patients with PSC-UC appears to increase the risk of recurrent PSC in the graft.[213–215] Overall, there is no evidence that proctocolectomy with IPAA alters the natural course of PSC.[206]

8. Conclusion

The present guidelines summarize the current evidence on the surgical management of adult UC. They aim to inform and support decision-making when advising and treating patients who may benefit from surgery.

Surgical decision pathways in UC are complex, with multiple options and several critical junctures. In many areas of UC surgery, evidence remains limited, and some recommendations rely more on clinical expertise than robust data. This highlights relevant evidence gaps and the need for targeted research. Incorporating patient lifestyle preferences and expectations is essential to shared decision-making and to achieving the best possible standard of care.

Although sufficient training, technical expertise, and an adequate caseload to achieve and maintain sub-specialization in IBD surgery are important, the key to success in managing UC is a multidisciplinary team, as no single specialist can address all clinical dimensions of the disease. These guidelines were developed with this interdisciplinary framework in mind.

Where evidence is very weak or absent and evidence-based recommendations cannot be made, ECCO-JCC offers complementary resources, such as Topical Reviews and Position Papers. As new evidence emerges, the ECCO e-Guide will allow rapid integration into practice, while formal guideline updates follow the ECCO-JCC schedule.

Guidelines provide structured recommendations, but clinicians must adapt them to individual patients and their preferences by combining expert judgement, available evidence, and institutional capabilities, along with willingness to refer a patient when appropriate.

These recommendations should be integrated into a broader multidisciplinary treatment plan that may include pharmacological, nutritional, psychological, and other non-pharmacological interventions. ECCO-JCC will support dissemination through workshops, e-learning activities, the ECCO e-Guide, and other educational platforms, and will promote implementation of these guidelines in daily clinical practice.[216]

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Supplementary material

Supplementary material is available at *ECCO-JCC* online.

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Conflicts of interest

ECCO has diligently maintained a disclosure policy of potential conflicts of interests. The conflict-of-interest declaration is based on a form used by the International Committee of Medical Journal Editors [ICMJE]. The conflict of interest disclosures are not only stored at the ECCO Office and the editorial office of JCC, but are also open to public scrutiny on the ECCO website [https://www.ecco-ibd.eu/about-ecco/ecco-disclosures.html], providing a comprehensive overview of potential conflicts of interest of the authors.

Disclaimer

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Data availability

The following material is available in the supplementary materials: the list and grading of each outcome; the specific search strings developed for each PICO question; a list of the full-text articles retrieved for final data extraction and analysis; and the OEBM tables for each PICO, including recommendations, levels of evidence, and key findings.

References

1. Ng SC, Shi HY, Hamidi N, et al. Worldwide incidence and prevalence of inflammatory bowel disease in the 21st century: A systematic review of population-based studies. *Lancet*. 2017;390:2769-2778.
2. Santiago M, Stocker F, Ministro P, et al. Incidence trends of inflammatory bowel disease in a southern European country: a mirror of the western world? *Clin Transl Gastroenterol*. 2022;13:e00481.
3. Tsai L, Ma C, Dulai PS, et al. Contemporary risk of surgery in patients with ulcerative colitis and Crohn's disease: a meta-analysis of population-based cohorts. *Clin Gastroenterol Hepatol*. 2021;19:2031-2045 e11.
4. Dong C, Metzger M, Holsbo E, Perduca V, Carbonnel F. Systematic review with meta-analysis: mortality in acute severe ulcerative colitis. *Aliment Pharmacol Ther*. 2020;51:8-33.
5. Elford AT, Constantine-Cooke N, Jenkinson PW, et al. Twenty-year trends in colectomy rates and advanced therapy prescribing in Lothian, Scotland. *Aliment Pharmacol Ther*. 2025;62:699-709.
6. Worley G, Almoudaris A, Bassett P, et al. Colectomy rates for ulcerative colitis in England 2003-2016. *Aliment Pharmacol Ther*. 2021;53:484-498.
7. Tsai L, Nguyen NH, Ma C, et al. Systematic review and meta-analysis: risk of hospitalization in patients with ulcerative colitis and Crohn's disease in population-based cohort studies. *Dig Dis Sci*. 2022;67:2451-2461.
8. Zheng J, Fan Z, Li C, et al. Predictors for colectomy in patients with acute severe ulcerative colitis: a systematic review and meta-analysis. *BMJ Open Gastroenterol*. 2024;11:e001587.
9. Yamamoto T, Carvello M, Lightner AL, Spinelli A, Kotze PG. Up-to-date surgery for ulcerative colitis in the era of biologics. *Expert Opin Biol Ther*. 2020;20:391-398.
10. Gros B, Kaplan GG. Ulcerative colitis in adults: a review. *JAMA*. 2023;330:951-965.
11. Goyal MK, Hassan SA, Berinstein JA. Managing acute severe ulcerative colitis in 2025 and beyond. *Curr Gastroenterol Rep*. 2026;28:3.
12. Mowat C, Cole A, Windsor A, et al.; IBD Section of the British Society of Gastroenterology. Guidelines for the management of inflammatory bowel disease in adults. *Gut*. 2011;60:571-607.
13. Henriksen M, Jahnsen J, Lygren I, et al.; IBSEN Study Group. Ulcerative colitis and clinical course: results of a 5-year population-based follow-up study (the Ibsen study). *Inflamm Bowel Dis*. 2006;12:543-550.
14. Leijonmarck CE, Persson PG, Hellers G. Factors affecting colectomy rate in ulcerative colitis: an epidemiologic study. *Gut*. 1990;31:329-333.
15. Shamsiddinova A, Burch J, Deputy M, et al. Oncological outcomes of patients with inflammatory bowel disease undergoing segmental colonic resection for colorectal cancer and dysplasia: systematic review. *BJS Open*. 2024;8:zrae052.
16. Kayal M, Bislenghi G, Adamina M, et al. ECCO topical review on pouch disorders. *J Crohns Colitis*. 2025;19:jjaf103.
17. Ricardo AP, Kayal M, Plietz MC, et al. Predictors of pouch failure: a tertiary care inflammatory bowel disease centre experience. *Colorectal Dis*. 2023;25:1469-1478.
18. Pooni A, Brar MS, Kennedy E, et al. Transabdominal IPAA revision: does indication dictate outcome? *Dis Colon Rectum*. 2023;66:559-566.

19. Raine T, Bonovas S, Burisch J, et al. ECCO guidelines on therapeutics in ulcerative colitis: medical treatment. *J Crohns Colitis*. 2022;16:2-17.
20. Spinelli A, Bonovas S, Burisch J, et al. ECCO guidelines on therapeutics in ulcerative colitis: surgical treatment. *J Crohns Colitis*. 2022;16:179-189.
21. Atkins D, Eccles M, Flottorp S, et al.; GRADE Working Group. Systems for grading the quality of evidence and the strength of recommendations I: critical appraisal of existing approaches the grade working group. *BMC Health Serv Res*. 2004;4:38.
22. Fitch K, Bernstein SJ, Aguilar MD, et al. *The RAND/UCLA Appropriateness Method User's Manual*. Rand Corporation; 2001 https://wwwrandorg/pubs/monograph_reports/MR1269html.
23. Oxford Centre for Evidence-Based Medicine. Oxford Centre for Evidence-Based Medicine: levels of evidence (March 2009) Accessed 08.05.2021, 2009.
24. Howick J, Chalmers I, Glasziou P, et al. Explanation of the 2011 Oxford Centre for Evidence-Based Medicine (OCEBM) Levels of Evidence (Background Document). https://www.cebm.ox.ac.uk/resources/levels-of-evidence/explanation-of-the-2011-ocebm-levels-of-evidence/ Accessed 12.06.2025.
25. Godfrey D, Koczanowski S, Selvarajah J, et al. Exploring the evidence that supports the benefits of the multidisciplinary team in inflammatory bowel disease. *Am J Med*. 2025;138:1724-1733 e1.
26. Kotze PG. The essential role of a multidisciplinary approach in inflammatory bowel diseases. *Clin Colon Rectal Surg*. 2022;35:3-4.
27. Justiniano CF, Aquina CT, Becerra AZ, et al. Postoperative mortality after nonelective surgery for inflammatory bowel disease patients in the era of biologics. *Ann Surg*. 2019;269:686-691.
28. Fiorino G, Lytras T, Younge L, et al. Quality of care standards in inflammatory bowel diseases: a European Crohn's and Colitis Organisation [ECCO] position paper. *J Crohns Colitis*. 2020;14:1037-1048.
29. Park L, Truong A, Zaghiyan K, Fleshner P. A single-center comparative study of open transabdominal and laparoscopic transanal ileal pouch-anal anastomosis with total mesorectal excision. Has the bar been raised? *J Gastrointest Surg*. 2022;26:1070-1076.
30. Helavirta I, Lehto K, Huhtala H, et al. Pouch failures following restorative proctocolectomy in ulcerative colitis. *Int J Colorectal Dis*. 2020;35:2027-2033.
31. Horio Y, Uchino M, Bando T, et al. Incidence, risk factors and outcomes of cancer of the anal transitional zone in patients with ulcerative colitis. *J Crohns Colitis*. 2020;14:1565-1571.
32. Lim MH, Lord AR, Simms LA, et al. Ileal pouch-anal anastomosis for ulcerative colitis: an Australian institution's experience. *Ann Coloproctol*. 2021;37:318-325.
33. Kotze PG, Avellaneda N, Moretti RAM, et al. Controversies in IPAA for ulcerative colitis: a systematic review of different anastomotic techniques. *Dis Colon Rectum*. 2024;67:S26-S35.
34. Hagihara K, Mori R, Sekido Y, et al. Defecation function after laparo-assisted restorative proctocolectomy with ileal pouch anal anastomosis for ulcerative colitis. *J Laparoendosc Adv Surg Tech A*. 2021;32:600-605.
35. Giddings HL, Yang PF, Steffens D, Solomon MJ, Ng KS. Influence of hospital-level and surgeon factors on the outcomes after ileo-anal pouch surgery for inflammatory bowel disease: systematic review. *Br J Surg*. 2024;111:znae088.
36. Burns EM, Bottle A, Aylin P, et al. Volume analysis of outcome following restorative proctocolectomy. *Br J Surg*. 2011;98:408-417.
37. Torres J, Billioud V, Sachar DB, Peyrin-Biroulet L, Colombel JF. Ulcerative colitis as a progressive disease: the forgotten evidence. *Inflamm Bowel Dis*. 2012;18:1356-1363.
38. Lewis JD, Scott FI, Brensinger CM, et al. Increased mortality rates with prolonged corticosteroid therapy when compared with antitumor necrosis factor-alpha-directed therapy for inflammatory bowel disease. *Am J Gastroenterol*. 2018;113:405-417.
39. Doherty G, Katsanos KH, Burisch J, et al. European Crohn's and Colitis Organisation topical review on treatment withdrawal ['exit strategies'] in inflammatory bowel disease. *J Crohns Colitis*. 2018;12:17-31.
40. Gordon H, Biancone L, Fiorino G, et al. ECCO guidelines on inflammatory bowel disease and malignancies. *J Crohns Colitis*. 2023;17:827-854.
41. Clement E, Lin W, Shojaei D, et al. Modified 2-stage IPAA has similar postoperative complication rates and functional outcomes compared to 3-stage IPAA. *Am J Surg*. 2024;231:96-99.
42. Brunner M, Brandl M, Denz A, et al. 2-stage and 3-stage restorative proctocolectomy with ileal pouch-anal anastomosis for ulcerative colitis show comparable short- and long-term outcomes. *Sci Rep*. 2024;14:22807.
43. Group AS. Appendicectomy plus standard medical therapy versus standard medical therapy alone for maintenance of remission in ulcerative colitis (accure): a pragmatic, open-label, international, randomised trial. *Lancet Gastroenterol Hepatol*. 2025;10:550-561.
44. Visser E, Reijntjes MA, Heuthorst L, et al.; COSTA Study Group. Appendicectomy versus switching to a Jak inhibitor in inducing remission in patients with active ulcerative colitis after biologic therapy failure (COSTA): 1-year results of a multicentre, prospective, cohort study. *Lancet Gastroenterol Hepatol*. 2026;11:190-203.
45. Turner D, Ricciuto A, Lewis A, et al.; International Organization for the Study of IBD. Stride-II: an update on the Selecting Therapeutic Targets In Inflammatory Bowel Disease (STRIDE) initiative of the International Organization for the Study of IBD (IOIBD): determining therapeutic goals for treat-to-target strategies in IBD. *Gastroenterology*. 2021;160:1570-1583.
46. Pandey A, Achrafie L, Kodjamanova P, Tencer T, Kumar J. Endoscopic mucosal healing and histologic remission in ulcerative colitis: a systematic literature review of clinical, quality-of-life and economic outcomes. *Curr Med Res Opin*. 2022;38:1531-1541.
47. Kohler LW, Pemberton JH, Zinsmeister AR, Kelly KA. Quality of life after proctocolectomy. A comparison of Brooke ileostomy, Kock pouch, and ileal pouch-anal anastomosis. *Gastroenterology*. 1991;101:679-684.
48. Kaiser AM, Beart RW.Jr. Surgical management of ulcerative colitis. *Swiss Med Wkly*. 2001;131:323-337.
49. Liu X, Yang Q, Diao N, et al. Changes in the clinical course and prognosis of ulcerative colitis in Chinese populations: a retrospective cohort study. *Intest Res*. 2024;22:357-368.
50. Carvello M, Watfah J, Włodarczyk M, Spinelli A. The management of the hospitalized ulcerative colitis patient: the medical-surgical conundrum. *Curr Gastroenterol Rep*. 2020;22:11.
51. Bitton A, Buie D, Enns R, et al.; Canadian Association of Gastroenterology Severe Ulcerative Colitis Consensus Group. Treatment of hospitalized adult patients with severe ulcerative colitis: Toronto consensus statements. *Am J Gastroenterol*. 2012; 107:179-194.
52. Lightner AL, Mathis KL, Dozois EJ, et al. Results at up to 30 years after ileal pouch-anal anastomosis for chronic ulcerative colitis. *Inflamm Bowel Dis*. 2017;23:781-790.
53. Fradet C, Kern J, Atanasov P, Wirth D, Borsi A. Impact of surgery and its complications in ulcerative colitis patients in clinical practice: a systematic literature review of real-world evidence in Europe. *Int J Surg Open*. 2020;22:22-32.

54. Festa S, Scribano ML, Pugliese D, et al. Long-term outcomes of acute severe ulcerative colitis in the rescue therapy era: a multicentre cohort study. *United European Gastroenterol J*. 2021;9:507-516.
55. Li A, Coote M, Thin L. Prevalence and risk factors for early medical and surgical complications following an admission for acute severe ulcerative colitis. *Ther Adv Gastroenterol*. 2023;16:175628 48231215148.
56. Kuehn F, Hodin RA. Impact of modern drug therapy on surgery: ulcerative colitis. *Visc Med*. 2018;34:426-431.
57. Ji Y, Li H, Dai G, Zhang X, Ju W. Systematic review and meta-analysis: impact of depression on prognosis in inflammatory bowel disease. *J Gastroenterol Hepatol*. 2024;39:1476-1488.
58. Abdalla S, Duval Q, Touzmanian J, et al. Robotic ileal pouch-anal anastomosis after proctectomy: a feasible and promising approach? Short-term outcomes and long-term functional results from a two-center retrospective study. *J Robot Surg*. 2026;20:152.
59. Zaman S, Mohamedahmed AYY, Abdelrahman W, et al. Minimally invasive surgery for inflammatory bowel disease: a systematic review and meta-analysis of robotic versus laparoscopic surgical techniques. *J Crohns Colitis*. 2024;18:1342-1355.
60. Violante T, Broccard SP, Novelli M, et al. Comparative analysis of robotic, laparoscopic, and open ileal pouch-anal anastomosis outcomes: retrospective cohort study. *BJS Open*. 2025;9:zraf084.
61. Emile SH, Khan SM, Wexner SD. A systematic review and meta-analysis of the outcome of ileal pouch anal anastomosis in patients with obesity. *Surgery*. 2021;170:1629-1636.
62. Khawaja Z, Jamal Z, Zafar N, et al. Role of robotic approach in ileal pouch-anal anastomosis (IPAA): a systematic review of the literature. *J Robot Surg*. 2023;17:941-947.
63. Abd El Aziz MA, Calini G, Grass F, et al. Minimally invasive ileal pouch-anal anastomosis for patients with obesity: a propensity score-matched analysis. *Langenbecks Arch Surg*. 2021;406:2419-2424.
64. Aydinli HH, Esen E, Aytac E, et al. Transabdominal pouch salvage for failed minimally invasive versus open IPAA: a case-matched study. *Dis Colon Rectum*. 2020;63:1102-1107.
65. Hanaoka M, Kinugasa Y, Yao K, et al. Comparison of short-term outcomes and defecatory function following robotic and conventional laparoscopic surgery for stapled-ileal pouch-anal anastomosis: a retrospective cohort study. *Int J Surg*. 2024;110:7112-7120.
66. Baker DM, Folan AM, Lee MJ, et al. A systematic review and meta-analysis of outcomes after elective surgery for ulcerative colitis. *Colorectal Dis*. 2021;23:18-33.
67. Alipouriani A, Yalamarthi N, Sancheti H, et al. A propensity score-matched analysis of single-port vs multiport laparoscopic total abdominal colectomy with end ileostomy for medically refractory ulcerative colitis. *Dis Colon Rectum*. 2024;67:1139-1148.
68. Aguirre-Allende I, Enríquez-Navascués JM, Elorza G, et al. Care burden and outcome of the surgical management of ulcerative colitis: a retrospective analysis of the last 20 years in a tertiary hospital in Spain. *Cir Esp (Engl Ed)*. 2023;101:12-19.
69. Burns L, Kelly ME, Whelan M, et al. A contemporary series of surgical outcomes following subtotal colectomy and/or completion proctectomy for management of inflammatory bowel disease. *Ir J Med Sci*. 2022;191:2705-2710.
70. Kotze PG, Heuthorst L, Lightner AL, Damião AOMC, Bemelman WA. New insights on the surgical management of ulcerative colitis in the 21st century. *Lancet Gastroenterol Hepatol*. 2022;7:679-688.
71. Bartels SA, Vlug MS, Henneman D, et al. Less adhesiolysis and hernia repair during completion proctocolectomy after laparoscopic emergency colectomy for ulcerative colitis. *Surg Endosc*. 2012;26:368-373.
72. Bartels SA, D'Hoore A, Cuesta MA, et al. Significantly increased pregnancy rates after laparoscopic restorative proctocolectomy: a cross-sectional study. *Ann Surg*. 2012;256:1045-1048.
73. Torres J, Chaparro M, Julsgaard M, et al. European Crohn's and Colitis guidelines on sexuality, fertility, pregnancy, and lactation. *J Crohns Colitis*. 2023;17:1-27.
74. McKee RF, Keenan RA, Munro A. Colectomy for acute colitis: is it safe to close the rectal stump? *Int J Colorectal Dis*. 1995;10:222-224.
75. Ozuner G, Strong SA, Fazio VW. Effect of rectosigmoid stump length on restorative proctocolectomy after subtotal colectomy. *Dis Colon Rectum*. 1995;38:1039-1042.
76. Lawday S, Leaning M, Flannery O, et al. Rectal stump management in inflammatory bowel disease: a cohort study, systematic review and proportional analysis of perioperative complications. *Tech Coloproctol*. 2020;24:671-684.
77. Lissel M, Omidy S, Myrelid P, Block M, Angenete E. The handling of the rectal stump does not affect severe morbidity after subtotal colectomy for ulcerative colitis: a retrospective cohort study. *Scand J Surg*. 2020;109:238-243.
78. Mege D, Stellingwerf ME, Germain A, et al. Management of rectal stump during laparoscopic subtotal colectomy for inflammatory bowel disease: a comparative cohort study from six referral centres. *J Crohns Colitis*. 2020;14:1214-1221.
79. Kroner PT, Merchea A, Colibaseanu D, et al. The use of ileal pouch-anal anastomosis in patients with ulcerative colitis from 2009 to 2018. *Colorectal Dis*. 2022;24:308-313.
80. Chen KA, Pak J, Agala CB, et al. Factors associated with performing IPAA after total colectomy for ulcerative colitis. *Dis Colon Rectum*. 2024;67:674-680.
81. Deyrat J, Challine A, Voron T, et al.; Saint-Antoine IBD Network. What is the rate of definitive stoma after subtotal colectomy for inflammatory bowel disease? A nationwide study of 1860 patients. *Colorectal Dis*. 2024;26:1203-1213.
82. Stephens IJB, Murphy B, McCawley N, McNamara DA, Burke JP. The fate of the rectum in ulcerative colitis at index surgery and beyond-a contemporary cohort. *Int J Colorectal Dis*. 2025;40:12.
83. Kuruvilla K, Osler T, Hyman NH. A comparison of the quality of life of ulcerative colitis patients after IPAA vs ileostomy. *Dis Colon Rectum*. 2012;55:1131-1137.
84. Murphy PB, Khot Z, Vogt KN, Ott M, Dubois L. Quality of life after total proctocolectomy with ileostomy or IPAA: a systematic review. *Dis Colon Rectum*. 2015;58:899-908.
85. Hassab T, McKinney D, D'Adamo CD, et al. Short-term outcomes for restorative and non-restorative proctocolectomy in older adults. *J Surg Res*. 2022;269:11-17.
86. Lundstrom S, Buchwald P, Agger E. A retrospective cohort study on renal morbidity related to stoma type in inflammatory bowel disease patients following colectomy and ileal pouch-anal anastomosis surgery. *Scand J Surg*. 2024;113:202-210.
87. Schabl L, Holubar SD, Maspero M, Steele SR, Hull T. Ileal pouch-anal anastomosis and end ileostomy result in equivalent graft survival following liver transplantation for inflammatory bowel disease-primary sclerosing cholangitis. *Tech Coloproctol*. 2024;28:113.
88. Kartheuser AH, Dozois RR, LaRusso NF, et al. Comparison of surgical treatment of ulcerative colitis associated with primary sclerosing cholangitis: Ileal pouch-anal anastomosis versus Brooke ileostomy. *Mayo Clin Proc*. 1996;71:748-756.
89. Georganta I, McIntosh S, Boldovjakova D, et al. The incidence of malignancy in the residual rectum of IBD patients after colectomy:

a systematic review and meta-analysis. *Tech Coloproctol*. 2023;27:699-712.
90. Landerholm K, Abdalla M, Myrelid P, Andersson RE. Survival of ileal pouch anal anastomosis constructed after colectomy or secondary to a previous ileorectal anastomosis in ulcerative colitis patients: a population-based cohort study. *Scand J Gastroenterol*. 2017;52:531-535.
91. Waljee A, Waljee J, Morris AM, Higgins PD. Threefold increased risk of infertility: a meta-analysis of infertility after ileal pouch anal anastomosis in ulcerative colitis. *Gut*. 2006;55:1575-1580.
92. de Buck van Overstraeten A, Brar MS, Khorasani S, Dossa F, Myrelid P. Ileorectal anastomosis versus IPAA for the surgical treatment of ulcerative colitis: a Markov decision analysis. *Dis Colon Rectum*. 2020;63:1276-1284.
93. Orchard MR, Saracino A, Hooper J, Shabbir J. Ileorectal anastomosis in ulcerative colitis: what do surgeons and patients need to know? A systematic literature review. *Ann R Coll Surg Engl*. 2025;107:174-179.
94. Al-Rashedy M, Mukherjee T, Askari A, Gurjar S. A systematic review of outcomes and quality of life after ileorectal anastomosis for ulcerative colitis. *Arab J Gastroenterol*. 2023;24:79-84.
95. Derikx LA, Kievit W, Drenth JP, et al.; Dutch Initiative on Crohn and Colitis. Prior colorectal neoplasia is associated with increased risk of ileoanal pouch neoplasia in patients with inflammatory bowel disease. *Gastroenterology*. 2014;146:119-128.e1.
96. Risto A, Nordenvall C, Deputy M, et al. Colectomy reconstruction for ulcerative colitis in Sweden and England: a multicenter prospective comparison between ileorectal anastomosis and ileal pouch-anal anastomosis after colectomy in patients with ulcerative colitis (CRUISE-study). *BMC Surg*. 2023;23:96.
97. Alsafi Z, Snell A, Segal JP. Prevalence of 'pouch failure' of the ileoanal pouch in ulcerative colitis: a systematic review and meta-analysis. *Int J Colorectal Dis*. 2022;37:357-364.
98. Abdalla M, Norblad R, Olsson M, et al. Anorectal function after ileo-rectal anastomosis is better than pelvic pouch in selected ulcerative colitis patients. *Dig Dis Sci*. 2020;65:250-259.
99. Fornaro R, Casaccia M, Caristo G, et al. Elective surgery for ulcerative colitis, ileo-rectal anastomosis or restorative proctocolectomy an update. *Ann Ital Chir*. 2019;90:565-573.
100. Druvefors E, Landerholm K, Andersson RE, Sydsjo G, Myrelid P. Reasons for reduced reproduction after colectomy in women with ulcerative colitis. *Scand J Gastroenterol*. 2024;59:1289-1296.
101. Druvefors E, Myrelid P, Andersson RE, Landerholm K. Female and male fertility after colectomy and reconstructive surgery in inflammatory bowel disease: a national cohort study from Sweden. *J Crohns Colitis*. 2023;17:1631-1638.
102. Abdalla M, Landerholm K, Andersson P, Andersson RE, Myrelid P. Risk of rectal cancer after colectomy for patients with ulcerative colitis: a national cohort study. *Clin Gastroenterol Hepatol*. 2017;15:1055-1060 e2.
103. Derikx L, Nissen LHC, Smits LJT, Shen B, Hoentjen F. Risk of neoplasia after colectomy in patients with inflammatory bowel disease: a systematic review and meta-analysis. *Clin Gastroenterol Hepatol*. 2016;14:798-806 e20.
104. Ishii H, Hata K, Kishikawa J, et al. Incidence of neoplasias and effectiveness of postoperative surveillance endoscopy for patients with ulcerative colitis: comparison of ileorectal anastomosis and ileal pouch-anal anastomosis. *World J Surg Oncol*. 2016;14:75.
105. Uzzan M, Kirchgesner J, Oubaya N, et al. Risk of rectal neoplasia after colectomy and ileorectal anastomosis for ulcerative colitis. *J Crohns Colitis*. 2017;11:930-935.
106. Nordenvall C, Olen O, Johan Nilsson P, et al. Restorative surgery in patients with primary sclerosing cholangitis and ulcerative colitis following a colectomy. *Inflamm Bowel Dis*. 2018;24:624-632.
107. Uzzan M, Cosnes J, Amiot A, et al. Long-term follow-up after ileorectal anastomosis for ulcerative colitis: a GETAID/GETAID Chirurgie multicenter retrospective cohort of 343 patients. *Ann Surg*. 2017;266:1029-1034.
108. Andersson P, Norblad R, Soderholm JD, Myrelid P. Ileorectal anastomosis in comparison with ileal pouch anal anastomosis in reconstructive surgery for ulcerative colitis—a single institution experience. *J Crohns Colitis*. 2014;8:582-589.
109. Risto A, Andersson RE, Landerholm K, et al. Reoperations and long-term survival of Kock's continent ileostomy in patients with IBD: a population-based national cohort study from Sweden. *Dis Colon Rectum*. 2023;66:1492-1499.
110. Risto A, Hallbook O, Andersson P, Sjodahl R, Myrelid P. Long-term follow-up, patient satisfaction, and quality of life for patients with Kock's continent ileostomy. *Dis Colon Rectum*. 2021;64:420-428.
111. Aytac E, Dietz DW, Ashburn J, Remzi FH. Is conversion of a failed IPAA to a continent ileostomy a risk factor for long-term failure? *Dis Colon Rectum*. 2019;62:217-222.
112. Ecker NKJ, Dinh C, Moslein G, Ecker KW. Comparing continent ileostomy (CI) conversion to repair/redo IPAA: favorable outcomes. *Int J Colorectal Dis*. 2023;38:261.
113. Deputy M, Worley G, Patel K, et al. Long-term outcome and quality of life after continent ileostomy for ulcerative colitis: a systematic review. *Colorectal Dis*. 2021;23:2286-2299.
114. Hardt J, Kienle P. Occult and manifest colorectal carcinoma in ulcerative colitis: how does it influence surgical decision making? *Viszeralmedizin*. 2015;31:252-257.
115. Lincango EP, Dominguez OH, Connelly TM, et al. Segmental colectomy versus total proctocolectomy for ulcerative colitis: a systematic review and meta-analysis. *Colorectal Dis*. 2025;27:e17278.
116. Gilat T, Hacohen D, Lilos P, Langman MJ. Childhood factors in ulcerative colitis and Crohn's disease. An international cooperative study. *Scand J Gastroenterol*. 1987;22:1009-1024.
117. Gardenbroek TJ, Eshuis EJ, Ponsioen CI, et al. The effect of appendectomy on the course of ulcerative colitis: a systematic review. *Colorectal Dis*. 2012;14:545-553.
118. Welsh S, Sam Z, Seenan JP, Nicholson GA. The role of appendicectomy in ulcerative colitis: systematic review and meta-analysis. *Inflamm Bowel Dis*. 2023;29:633-646.
119. Stellingwerf ME, Sahami S, Winter DC, et al. Prospective cohort study of appendicectomy for treatment of therapy-refractory ulcerative colitis. *Br J Surg*. 2019;106:1697-1704.
120. Reijntjes MA, Heuthorst L, Stellingwerf ME, et al. Long-term outcomes after appendicectomy as experimental treatment for patients with therapy-refractory ulcerative colitis. *Br J Surg*. 2024;111:znad425.
121. Bolin TD, Wong S, Crouch R, Engelman JL, Riordan SM. Appendicectomy as a therapy for ulcerative proctitis. *Am J Gastroenterol*. 2009;104:2476-2482.
122. Stellingwerf ME, Bemelman WA, Lowenberg M, et al.; the Parelsnoer Institute, the Dutch Initiative on Crohn, Colitisa. A nationwide database study on colectomy and colorectal cancer in ulcerative colitis: what is the role of appendectomy?* *Colorectal Dis*. 2021;23:64-73.
123. Visser E, Pinkney TD, Heuthorst L, et al. Predictors of maintained remission at one year following appendicectomy in ulcerative colitis: post-hoc analysis of the ACCURE trial. *Br J Surg*. 2025;112:znaf137.
124. Mark-Christensen A, Kristiansen EB, Myrelid P, Laurberg S, Erichsen R. Appendectomy and risk of advanced colorectal

neoplasia in inflammatory bowel disease: a nationwide population-based cohort study. *Inflamm Bowel Dis*. 2024; 30:877-883.
125. Stellingwerf ME, de Koning MA, Pinkney T, et al. The risk of colectomy and colorectal cancer after appendectomy in patients with ulcerative colitis: a systematic review and meta-analysis. *J Crohns Colitis*. 2019;13:309-318.
126. Hill SS, Ottaviano KE, Palange DC, et al.; NSQIP-IBD Collaborative. Impact of preoperative factors in patients with IBD on postoperative length of stay: a national surgical quality improvement program-inflammatory bowel disease collaborative analysis. *Dis Colon Rectum*. 2024;67:97-106.
127. Adamina M, Gerasimidis K, Sigall-Boneh R, et al. Perioperative dietary therapy in inflammatory bowel disease. *J Crohns Colitis*. 2020;14:431-444.
128. Tóth LM, Székely H, Rancz A, et al. Effect of obesity on postoperative complications in ulcerative colitis: a systematic review and meta-analysis. *Ann Gastroenterol Surg*. 2025;9:153-160.
129. Lee KE, Faye AS, Vermeire S, Shen B. Perioperative management of ulcerative colitis: a systematic review. *Dis Colon Rectum*. 2022;65:S5-S19.
130. Areán-Sanz R, Ore AS, Vigna C, et al. Role of age as a predictor of major complications after elective surgery for ulcerative colitis. *Am Surg*. 2024;90:887-896.
131. Law CC, Bell C, Koh D, et al. Risk of postoperative infectious complications from medical therapies in inflammatory bowel disease. *Cochrane Database Syst Rev*. 2020;10:Cd013256.
132. Cohen BL, Fleshner P, Kane SV, et al. Prospective cohort study to investigate the safety of preoperative tumor necrosis factor inhibitor exposure in patients with inflammatory bowel disease undergoing intra-abdominal surgery. *Gastroenterology*. 2022;163:204-221.
133. Law CCY, Narula A, Lightner AL, et al. Systematic review and meta-analysis: preoperative vedolizumab treatment and postoperative complications in patients with inflammatory bowel disease. *J Crohns Colitis*. 2018;12:538-545.
134. McKechnie T, Wang J, Springer JE, et al. Extended thromboprophylaxis following colorectal surgery in patients with inflammatory bowel disease: a comprehensive systematic clinical review. *Colorectal Dis*. 2020;22:663-678.
135. Murthy SK, Robertson McCurdy AB, Carrier M, McCurdy JD. Venous thromboembolic events in inflammatory bowel diseases: a review of current evidence and guidance on risk in the post-hospitalization setting. *Thromb Res*. 2020;194:26-32.
136. Griffiths BJ, Desborough MJR, Duijvestein M, et al. Hypercoagulation after hospital discharge in acute severe ulcerative colitis: a prospective study. *Clin Gastroenterol Hepatol*. 2025;23:1798-1807 e5.
137. Schlick CJR, Yuce TK, Yang AD, et al. A postdischarge venous thromboembolism risk calculator for inflammatory bowel disease surgery. *Surgery*. 2021;169:240-247.
138. Gozdzik M, Unninayar D, Siegal DM, et al. Risk factors for venous thromboembolism in inflammatory bowel disease: a systematic review and meta-analysis by phase of care. *Inflamm Bowel Dis*. 2025;31:2286-2295.
139. Gomez J, Theodosopoulos E, MacRae H, et al. Is extended venous thromboprophylaxis required in patients undergoing ileal pouch procedure for ulcerative colitis? *Colorectal Dis*. 2024;26:726-733.
140. Bernstein CN, Nugent Z, Singh H. Persistently high rate of venous thromboembolic disease in inflammatory bowel disease: a population-based study. *Am J Gastroenterol*. 2021;116: 1476-1484.
141. Lightner AL, Sklow B, Click B, et al. Venous thromboembolism in patients admitted for IBD: an enterprise-wide experience of 86,000 hospital encounters. *Dis Colon Rectum*. 2023;66:410-418.
142. Gomaa I, Aboelmaaty S, Bhatt H, et al. Tofacitinib exposure does not increase postoperative complications among patients with ulcerative colitis undergoing total colectomy: a retrospective case-control study. *Dis Colon Rectum*. 2024;67:1443-1449.
143. Bianchi G, Gavriilidis P, Martinez-Perez A, et al. Robotic multiquadrant colorectal procedures: a single-center experience and a systematic review of the literature. *Front Surg*. 2022;9:991704.
144. Bong JW, Yoon YS, Lee JL, et al. Short-term outcomes of elective 2-stage restorative proctocolectomy for ulcerative colitis in Korea: does laparoscopy have benefits? *Ann Coloproctol*. 2020;36: 41-47.
145. Chen SY, Radomski SN, Stem M, et al. National trends and outcomes of total proctocolectomy and completion proctectomy ileal pouch-anal anastomosis procedures for ulcerative colitis. *Colorectal Dis*. 2024;26:497-507.
146. Flynn J, Larach JT, Kong JCH, Warrier SK, Heriot A. Robotic versus laparoscopic ileal pouch-anal anastomosis (IPAA): a systematic review and meta-analysis. *Int J Colorectal Dis*. 2021;36:1345-1356.
147. Habermann A, Gassie H, Rustom S, et al. Trends in surgical outcomes for ileal pouch-anal anastomosis construction using a large nationwide database. *Colorectal Dis*. 2024;26:1950-1958.
148. Horan J, Brannigan A, Mulsow J, Shields C, Cahill R. Ileal pouch-anal anastomosis for ulcerative colitis: long-term outcomes and trends over time in a low-volume institution. *Ir J Med Sci*. 2021;190:143-149.
149. Mineccia M, Ferrero A, Rottoli M, et al.; ICON FUN study group. The impact of colectomy and restorative procedure on pouch function after ileo-pouch-anal anastomosis in ulcerative colitis. The icon fun study on behalf of the Italian Society of Colon and Rectal Surgery (SICCR) inflammatory bowel diseases committee. *Dig Liver Dis*. 2025;57:315-324.
150. Nozawa H, Hata K, Sasaki K, et al. Laparoscopic vs open restorative proctectomy after total abdominal colectomy for ulcerative colitis or familial adenomatous polyposis. *Langenbecks Arch Surg*. 2022;407:1605-1612.
151. Opoku D, Hart A, Thompson DT, et al. Equivalency of short-term perioperative outcomes after open, laparoscopic, and robotic ileal pouch anal anastomosis. Does procedure complexity override operative approach? *Surg Open Sci*. 2022;9:86-90.
152. Poggioli G, Rottoli M, Romano A, et al. A prospective analysis of the postoperative and long-term functional outcomes of a novel technique to perform rectal transection during laparoscopic restorative proctectomy and ileal pouch-anal anastomosis. *Tech Coloproctol*. 2022;26:583-590.
153. Stephens IJB, Byrnes KG, Burke JP. Transanal ileal pouch-anal anastomosis: a systematic review and meta-analysis of technical approaches and clinical outcomes. *Langenbecks Arch Surg*. 2024;409:153.
154. Uchino M, Ikeuchi H, Horio Y, et al. The impacts of laparoscopic restorative proctocolectomy for ulcerative colitis: systematic review and meta-analysis. *Inflamm Intest Dis*. 2024;9:62-70.
155. Beyer-Berjot L, Maggiori L, Birnbaum D, et al. A total laparoscopic approach reduces the infertility rate after ileal pouch-anal anastomosis: a 2-center study. *Ann Surg*. 2013;258:275-282.
156. Gorgun E, Cengiz TB, Aytac E, et al. Does laparoscopic ileal pouch-anal anastomosis reduce infertility compared with open approach? *Surgery*. 2019;166:670-677.
157. Bartels SA, Gardenbroek TJ, Aarts M, et al. Short-term morbidity and quality of life from a randomized clinical trial of close rectal

dissection and total mesorectal excision in ileal pouch-anal anastomosis. *Br J Surg*. 2015;102:281-287.
158. Levic Souzani K, Nielsen CB, Bulut O. Transanal completion proctectomy with close rectal dissection and ileal pouch-anal anastomosis for ulcerative colitis. *Asian J Endosc Surg*. 2019;12:281-286.
159. Reijntjes MA, de Jong DC, Bartels S, et al. Long-term outcomes after close rectal dissection and total mesorectal excision in ileal pouch-anal anastomosis for ulcerative colitis. *Tech Coloproctol*. 2023;27:297-307.
160. Moojen TB, Visser E, Reijntjes MA, et al.; MIRACLE collaborate research group. One-year stoma-free survival of ileoanal pouches for UC in European centers: the miracle project. *Ann Surg Open*. 2025;6:e596.
161. Garcia-Granero A, Pellino G, Fletcher-Sanfeliu D, et al. "Near-TME": proposed standardisation of the technique for proctectomy in male patients with ulcerative colitis. *Tech Coloproctol*. 2022;26:217-226.
162. Ferrer-Inaebnit E, Jeri McFarlene S, García-Granero García-Fuster A, González Argenté X. Female near-TME: standardization of proctectomy in women with ulcerative colitis. *Cir Esp (Engl Ed)*. 2024;102:32-39.
163. Luo WY, Singh S, Cuomo R, Eisenstein S. Modified two-stage restorative proctocolectomy with ileal pouch-anal anastomosis for ulcerative colitis: a systematic review and meta-analysis of observational research. *Int J Colorectal Dis*. 2020;35:1817-1830.
164. Jonker JE, Hofker HS, Trzpis M, Broens PMA. Fecal continence outcomes are associated with the type, height, and stage procedure of ileal pouch-anal anastomosis. *Int J Colorectal Dis*. 2020;35:1749-1757.
165. Pooni A, Brar MS, Kennedy E, et al. Routine diversion following delayed IPAA construction does not reduce the incidence of pouch-related sepsis or failure in patients with ulcerative colitis. *Colorectal Dis*. 2024;26:326-334.
166. Sherrill GC, Esckilsen S, Hudson J, et al. Relationship between stages of ileal pouch-anal anastomosis, timing of restoration of fecal continuity, and pouchitis. *Dig Dis Sci*. 2022;67:5220-5226.
167. Plietz MC, Kayal M, Rizvi A, et al. Slow and steady wins the race: a solid case for a 3-stage approach in ulcerative colitis. *Dis Colon Rectum*. 2021;64:1511-1520.
168. Wasmann KA, Reijntjes MA, Stellingwerf ME, et al. Endo-sponge assisted early surgical closure of ileal pouch-anal anastomotic leakage preserves long-term function: a cohort study. *J Crohns Colitis*. 2019;13:1537-1545.
169. Hallgren T, Fasth S, Nordgren S, Oresland T, Hultén L. The stapled ileal pouch—anal anastomosis. A randomized study comparing two different pouch designs. *Scand J Gastroenterol*. 1990;25:1161-1168.
170. Oresland T, Fasth S, Nordgren S, Hallgren T, Hultén L. A prospective randomized comparison of two different pelvic pouch designs. *Scand J Gastroenterol*. 1990;25:986-996.
171. Hallgren T, Fasth S, Nordgren S, et al. Manovolumetric characteristics and functional results in three different pelvic pouch designs. *Int J Colorectal Dis*. 1989;4:156-160.
172. McCormick PH, Guest GD, Clark AJ, et al. The ideal ileal-pouch design: a long-term randomized control trial of J- vs W-pouch construction. *Dis Colon Rectum*. 2012;55:1251-1257.
173. Selvaggi F, Giuliani A, Gallo C, et al. Randomized, controlled trial to compare the J-pouch and W-pouch configurations for ulcerative colitis in the maturation period. *Dis Colon Rectum*. 2000;43:615-620.
174. Keighley MR, Yoshioka K, Kmiot W. Prospective randomized trial to compare the stapled double lumen pouch and the sutured quadruple pouch for restorative proctocolectomy. *Br J Surg*. 1988;75:1008-1011.
175. Reijntjes MA, Bocharewicz EK, Hompes R, Buskens CJ, Bemelman WA. Incidence and causes of failure in various anatomical pouch designs 20 years after surgical primary ileal-pouch anal anastomosis construction. *Int J Colorectal Dis*. 2022;37:2491-2499.
176. Justiniano CF, Hull TL. Construction of J- and S-pouches. *Dis Colon Rectum*. 2022;65:S20-S25.
177. Øresland T, Bemelman WA, Sampietro GM, et al.; European Crohn's and Colitis Organisation (ECCO). European evidence based consensus on surgery for ulcerative colitis. *J Crohns Colitis*. 2015;9:4-25.
178. Celentano V, Manzo CA. Ten steps for ileoanal pouch anastomosis. *Colorectal Dis*. 2023;25:2093-2096.
179. Shibata C, Funayama Y, Fukushima K, et al. Factors affecting the bowel function after proctocolectomy and ileal J pouch-anal anastomosis for ulcerative colitis. *J Gastrointest Surg*. 2006;10:1065-1071.
180. Oresland T, Fasth S, Nordgren S, Akervall S, Hultén L. Pouch size: the important functional determinant after restorative proctocolectomy. *Br J Surg*. 1990;77:265-269.
181. Xu W, Tang W, Ding W, et al.; China UC Pouch Center Union. Surgical options for appropriate length of J-pouch construction for better outcomes and long-term quality of life in patients with ulcerative colitis after ileal pouch-anal anastomosis. *Gut Liver*. 2024;18:85-96.
182. Miratashi Yazdi SA, Fazeli MS, Ahmadi Amoli H, Rahimpour E, Behboudi B. Functional and quality of life outcomes after ileal pouch-anal anastomosis in short versus long ileal J-pouch configuration in ulcerative colitis patients: a cohort study. *Updates Surg*. 2020;72:827-833.
183. Kimura H, Toritani K, Kunisaki R, et al. Impact of the body mass index on the retention of the anorectal mucosa after double-stapled ileal pouch-anal anastomosis for ulcerative colitis. *BMC Gastroenterol*. 2023;23:32.
184. Chaouch MA, Hussain MI, Gouader A, et al. Stapled anastomosis versus hand-sewn anastomosis with mucosectomy for ileal pouch-anal anastomosis: a systematic review and meta-analysis of postoperative outcomes, functional outcomes, and oncological safety. *Cancer Control*. 2024;31:10732748241236338.
185. Fukui R, Nozawa H, Sakamoto A, et al. Temporal changes in functional outcomes of stapled and hand-sewn ileal pouch-anal anastomosis for ulcerative colitis and familial adenomatous polyposis. *Colorectal Dis*. 2023;25:396-403.
186. Kennedy ED, Rothwell DM, Cohen Z, McLeod RS. Increased experience and surgical technique lead to improved outcome after ileal pouch-anal anastomosis: a population-based study. *Dis Colon Rectum*. 2006;49:958-965.
187. Mark-Christensen A, Erichsen R, Brandsborg S, et al. Pouch failures following ileal pouch-anal anastomosis for ulcerative colitis. *Colorectal Dis*. 2018;20:44-52.
188. Sutton JM, Wima K, Wilson GC, et al. Factors associated with 30-day readmission after restorative proctocolectomy with IPAA: a national study. *Dis Colon Rectum*. 2014;57:1371-1378.
189. Hoang CM, Maykel JA, Davids JS, et al. Distribution of elective ileal pouch-anal anastomosis cases for ulcerative colitis: a study utilizing the University Health System Consortium database. *J Gastrointest Surg*. 2020;24:2613-2619.
190. Lee GC, Deery SE, Kunitake H, et al. Comparable perioperative outcomes, long-term outcomes, and quality of life in a retrospective analysis of ulcerative colitis patients following 2-stage versus 3-stage proctocolectomy with ileal pouch-anal anastomosis. *Int J Colorectal Dis*. 2019;34:491-499.

191. Kiran RP, da Luz Moreira A, Remzi FH, et al. Factors associated with septic complications after restorative proctocolectomy. *Ann Surg*. 2010;251:436-440.
192. Aviran E, Zaghiyan K, Fleshner P. The surgical management of ileal pouch strictures. *Dis Colon Rectum*. 2022;65:S105-S112.
193. Worley GHT, Segal JP, Warusavitarne J, Clark SK, Faiz OD. Management of early pouch-related septic complications in ulcerative colitis: a systematic review. *Colorectal Dis*. 2018;20:O181-O189.
194. Jawoosh M, Haffar S, Deepak P, et al. Volvulus of the ileal pouch-anal anastomosis: a meta-narrative systematic review of frequency, diagnosis, and treatment outcomes. *Gastroenterol Rep (Oxf)*. 2019;7:403-410.
195. Hembree AE, Scherl E. Diagnosis and management of cuffitis: a systematic review. *Dis Colon Rectum*. 2022;65:S85-S91.
196. Segal JP, Adegbola SO, Worley GHT, et al. A systematic review: the management and outcomes of ileal pouch strictures. *J Crohns Colitis*. 2018;12:369-375.
197. Lee KE, Shen B. Endoscopic therapy for pouch leaks and strictures: a systematic review. *Dis Colon Rectum*. 2022;65:S92-S104.
198. Patel P, Patel M, Ebrahim MA, Loganathan P, Adler DG. Endoscopic management of ileal pouch-anal anastomosis strictures: meta-analysis and systematic literature review. *Ann Gastroenterol*. 2025;38:60-67.
199. Machin M, Younan HC, Slesser AAP, Mohsen Y. Systematic review on the management of ileoanal pouch-vaginal fistulas after restorative proctocolectomy in the treatment of ulcerative colitis. *Colorectal Dis*. 2021;23:34-51.
200. Pellino G, Celentano V, Vinci D, et al. Ileoanal pouch-related fistulae: a systematic review with meta-analysis on incidence, treatment options and outcomes. *Dig Liver Dis*. 2023;55:342-349.
201. Bronze S, Kayal M, Estevinho MM, et al. Ileoanal pouch-related fistulas: a narrative review. *Inflamm Bowel Dis*. 2025;31:1716-1722.
202. Uchino T, Lincango EP, Hernandez Dominguez O, et al. Rediversion of the failing ileoanal pouch: first step in pouch salvage? *Inflamm Bowel Dis*. 2025;31:105-112.
203. MacDonald S, Au S, Thornton M, Macdonald A. Complications and functional outcomes after ileo-anal pouch excision-a systematic review of 14 retrospective observational studies. *Int J Colorectal Dis*. 2021;36:677-687.
204. Selvaggi F, Pellino G, Canonico S, Sciaudone G. Systematic review of cuff and pouch cancer in patients with ileal pelvic pouch for ulcerative colitis. *Inflamm Bowel Dis*. 2014;20:1296-1308.
205. Barnes EL, Holubar SD, Herfarth HH. Systematic review and meta-analysis of outcomes after ileal pouch-anal anastomosis in primary sclerosing cholangitis and ulcerative colitis. *J Crohns Colitis*. 2021;15:1272-1278.
206. Shen B, Yao Q, Scherl EJ. Management of primary sclerosing cholangitis and extraintestinal disorders in patients with ileal pouches: a systematic review. *Dis Colon Rectum*. 2024;67:S106-S114.
207. Gorgun E, Remzi FH, Manilich E, et al. Surgical outcome in patients with primary sclerosing cholangitis undergoing ileal pouch-anal anastomosis: a case-control study. *Surgery*. 2005;138:631-637. discussion 7–9.
208. Lepistö A, Kärkkäinen P, Järvinen HJ. Prevalence of primary sclerosing cholangitis in ulcerative colitis patients undergoing proctocolectomy and ileal pouch-anal anastomosis. *Inflamm Bowel Dis*. 2008;14:775-779.
209. Pavlides M, Cleland J, Rahman M, et al. Outcomes after ileal pouch anal anastomosis in patients with primary sclerosing cholangitis. *J Crohns Colitis*. 2014;8:662-670.
210. Wasmuth HH, Tranø G, Endreseth BH, et al. Primary sclerosing cholangitis and extraintestinal manifestations in patients with ulcerative colitis and ileal pouch-anal anastomosis. *J Gastrointest Surg*. 2010;14:1099-1104.
211. Urquhart SA, Comstock BP, Jin MF, et al. The incidence of pouch neoplasia following ileal pouch-anal anastomosis in patients with inflammatory bowel disease. *Inflamm Bowel Dis*. 2024;30:183-189.
212. Sica GS, Sensi B, Siragusa L, et al. Surgical management of colon cancer in ulcerative colitis patients with orthotopic liver transplant for primary sclerosing cholangitis. A systematic review. *Eur J Surg Oncol*. 2023;49:106922.
213. Alabraba E, Nightingale P, Gunson B, et al. A re-evaluation of the risk factors for the recurrence of primary sclerosing cholangitis in liver allografts. *Liver Transpl*. 2009;15:330-340.
214. Hildebrand T, Pannicke N, Dechene A, et al.; German PSC Study Group. Biliary strictures and recurrence after liver transplantation for primary sclerosing cholangitis: a retrospective multicenter analysis. *Liver Transpl*. 2016;22:42-52.
215. Ravikumar R, Tsochatzis E, Jose S, et al. Risk factors for recurrent primary sclerosing cholangitis after liver transplantation. *J Hepatol*. 2015;63:1139-1146.
216. ECCO. European Crohn's Colitis Organisation ECCO e-guide. http://www.e-guide.ecco-ibd.eu. Accessed January 2, 2026.

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