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The creation of an institutional preoperative checklist to support clinical risk assessment in patients with ulcerative colitis (UC) considering ileoanal pouch surgery

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3 **The creation of an institutional preoperative checklist to support clinical risk assessment in**
4 **patients with ulcerative colitis (UC) considering ileoanal pouch surgery**
5

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32
33 **Abstract**
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35 **Background:** Total proctocolectomy with ileal pouch-anal anastomosis (IPAA) is the most
36 established restorative operative approach for patients with ulcerative colitis (UC). It has
37 associated morbidity and the potential for major repercussions on quality of life. As such, patient
38 selection is crucial to its success. The main aim of this paper is to present an institutional
39 preoperative checklist to support clinical risk assessment and patient selection in those
40 considering IPAA.
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43 **Methods:** A literature review was performed to identify the risk factors associated with surgical
44 complications, decreased functional outcomes/quality of life, and pouch failure after IPAA.
45 Based upon this, a preliminary checklist was devised, and modified through an iterative process.
46 This was then evaluated by a consensus group comprising the Pouch multidisciplinary team
47 (MDT) core members.
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50 **Results:** The final pre-operative checklist includes assessment for risk factors such as gender,
51 advanced age, obesity, comorbidities, sphincteric impairment, Crohn's disease, and pelvic
52 radiation therapy. In addition, essential steps in the decision-making process, such as pouch
53 nurse counselling, and discussion regarding surgical alternatives are also included. The last step
54 of the checklist is discussion at a dedicated Pouch-MDT.
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56 **Discussion:** A preoperative checklist may support clinicians with the selection of patients that
57 are suitable for pouch surgery. It also serves as a useful tool to inform the discussion of cases at
58 the multidisciplinary team meeting.
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5 **Keywords (MeSH terms):** ulcerative colitis, inflammatory bowel diseases, restorative
6 proctocolectomy, ileoanal pouches, checklists, preoperative care.
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10 **What is already known on this topic?**

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12 Proctocolectomy with ileal pouch-anal anastomosis (IPAA) has become the most performed
13 operative approach for patients with ulcerative colitis. This procedure can have major
14 repercussions upon quality of life and is accompanied by significant short and long-term
15 complications. Therefore, it is crucial to identify patients who are truly suitable candidates for
16 IPAA.
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18 **What this study adds?**

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20 This study adds a comprehensive checklist to support clinical risk assessment in patients with
21 UC considering ileoanal pouch surgery.
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23 **How this study might affect research, practice or policy?**

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25 This work has introduced a tool that has the potential to assist clinicians in selecting suitable
26 patients for IPAA and facilitate comprehensive discussions of cases during multidisciplinary team
27 meetings.
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35 PJT, KS, ZPW, ALH, NA, MM and JW revised critically for intellectual content. All authors were
36 involved in reviewing the final manuscript.
37

38 **Competing interests.** No competing interests.
39

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41 Ethics Committee(s) or Institutional Board(s).
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Background

Ulcerative colitis (UC) is an idiopathic chronic inflammatory bowel disease (IBD) characterized by mucosal inflammation classically affecting the rectum and extending to proximal colon segments in a continuous pattern.[1] Treatment is aimed at the relief of symptoms, achievement of mucosal healing, maintenance of health-related quality of life, and avoidance of disability.[2] However, despite the advancements in medical therapy, approximately 15% to 20% of patients will require surgery during their lifetime, mainly because of medically refractory disease, acute severe colitis, and/or colorectal neoplasia.[3]

Currently, total proctocolectomy with ileal pouch-anal anastomosis (IPAA) is the procedure of choice for patients with ulcerative colitis requiring surgery, however, there are other restorative and non-restorative options[3,4] (see **Table 1**). The decision-making process can be difficult and must be shared with the patient, as such surgery in some cases can have significant repercussions with regard to quality of life.[4,5]

Although total proctocolectomy with IPAA (see **Figure 1**) has become the most performed operative approach for patients with UC, this procedure is associated with short-term complications, such as pelvic sepsis (related to anastomotic leak) and bleeding, as well as long-term complications, such as poor function, ongoing inflammatory complications and pouch failure.[4] Given that the occurrence of these complications is not negligible, it is crucial to identify patients who are truly suitable candidates for IPAA. Alternative options are total proctocolectomy with end ileostomy or continent ileostomy, and ileorectal anastomosis.[3,4] Certainly, not all patients are suitable for these procedures, but in highly selected cases these procedures may be performed after careful decision-making.

The objective of this work is to propose a preoperative checklist to assist in the selection of patients who are eligible for IPAA.

Methods

A literature review was performed to identify evidence-based risk factors for pouch intraoperative/postoperative complications, decreased functional outcomes/quality of life, and pouch failure in patients with IBD undergoing the IPAA procedure. We searched for relevant publications using Medline/PubMed database up to May 30, 2023. The following keywords alone or matched with the Boolean operators 'AND' or 'OR' were used: "ulcerative colitis", "ileal pouch-anal anastomosis", "restorative proctocolectomy", "postoperative complication", "pouch failure", "function", "outcome", "quality of life". Pouch failure was defined as the need for a permanent ileostomy with or without pouch excision.

All articles identified within the initial search were screened for relevance and content, and their bibliographies searched for any additional relevant articles.

Based on the risk factors identified in the literature review, a preliminary checklist was devised to support clinical decision-making in the outpatient clinic to improve discussion and awareness of risks with the patient. Modified Nominal Group Technique was the consensus development method employed to establish a transparent and accountable process. All the authors provided feedback on the preliminary checklist through an iterative process, involving repeated face-to-face and online interactions to rectify inconsistencies and achieve convergence

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3 of opinion within the group. Additionally, the draft's logical and technical guidance was
4 electronically circulated among task force members.
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6 Finally, the checklist was then evaluated and validated by IBD professionals at our
7 regional Pouch Multidisciplinary Team (MDT) meeting that included colorectal surgeons
8 specialising in pouch surgery, gastroenterologists, pouch nurses, as well as radiologists and
9 pathologists through consensus.
10

11 12 13 14 **Results**

15 A total of 9,074 published articles were identified from the initial literature search. Eight
16 thousand eight hundred sixty-five publications were excluded following a review of titles and
17 abstracts, along with the removal of duplicates. Two hundred and nine articles were fully
18 reviewed, and from these, forty-three were selected for extraction of risk factors to substantiate
19 the development of the checklist. **Figure 2** illustrates the flow diagram.
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22 A checklist was devised based on the identified factors associated with surgical
23 complications, pouch failure, and decreased functional outcomes/quality of life after IPAA.
24 Studies addressing risk factors associated with intraoperative and postoperative complications
25 are shown in Table 2. With regards to risk factors for pouch failure, studies that addressed this
26 issue are described in Table 3. Studies addressing risk factors for poor functional outcomes and
27 decreased quality of life are described in Table 4.
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30 All the authors provided feedback on the preliminary checklist through an iterative
31 process. Consensus on the checklist items was reached using Modified Nominal Group
32 Technique. Subsequently, the tool was validated through an expert consensus group comprising
33 core members of the Pouch MDT.
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35 This tool ensures the appropriate preoperative screening for the evaluation of factors
36 associated with surgical complications, poor functional outcomes and pouch failure. These
37 factors include gender,[6–17] advanced age,[15,18–26] obesity,[7,8,27–36]
38 comorbidities,[6,37–42] sphincteric impairment,[43] Crohn's disease,[12,13,44–46] and pelvic
39 irradiation.[47] In addition, the checklist includes essential confirmation of decision-making
40 processes such as pouch nurse counselling, discussion regarding surgical alternatives (ileorectal
41 anastomosis, end ileostomy, or continent ileostomy), discussion regarding the need of
42 mucosectomy and evaluation in an IBD/Pouch MDT. See **Figure 3**.
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48 **Discussion**

49 The use of checklists has been gaining popularity in health care over the last few
50 decades, notably in fields such as emergency medicine, surgery, endoscopy, and intensive care.
51 When effectively implemented, checklists have the potential to improve healthcare processes,
52 prevent communication failures, and reduce morbidity and mortality rates.[48] As an
53 internationally recognised centre for pouch dysfunction our clinicians and allied healthcare
54 professionals have developed an appreciation of pouch failure and its associated risk factors.
55 Using an iterative process and through expert consensus among dedicated IBD professionals,
56 we have devised a comprehensive checklist to support clinical risk assessment in patients with
57 UC considering ileoanal pouch surgery. This checklist is currently used in the preoperative
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3 evaluation of UC patients at St. Mark's Hospital and comprises a series of criteria that represent
4 risk factors for intraoperative and postoperative complications, poor functional outcomes, and
5 pouch failure in IPAA procedures.
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8 Thorough clinical screening is crucial to prevent unnecessary morbidity, poor functional
9 results, or/and pouch failure. So, it is essential that all risks are assessed in the preoperative
10 period, and most importantly, communicated to the patient with appropriate counselling and
11 consent. This strengthens the therapeutic relationship between the patient and the treating
12 clinician and enhances the shared decision-making process. Moreover, some of the risks
13 associated with pouch surgery, such as obesity, can be mitigated and optimized pre-emptively.
14 Other factors, such as indeterminate colitis or a suspected diagnosis of Crohn's disease, will raise
15 a "red flag" and may represent scenarios to reconsider pouch surgery. Checklists aim to
16 streamline patient flow and act as an adjunct to augment clinical decision-making. Some
17 prognostic models have been proposed to predict long-term outcomes,[49–51] however, the
18 impact and dissemination of those models in clinical practice are uncertain.
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22 Concerns around pouch construction and suitability begin with the patient's basic
23 characteristics such as sex, age, and BMI. Pouch construction in obese male patients is
24 sometimes problematic owed to the narrow pelvis rendering rectal dissection challenging,
25 sometimes resulting in longer operating time, greater blood loss, and higher rates of
26 intraoperative failed IPAA.[6,7,9] Long-term complications such as pouch failure/dysfunction
27 and pelvic nerve injury may also occur more frequently amongst this group.[14,52] Alternatively,
28 when considering IPAA in females, risk to fecundity, which some studies suggest may be three
29 to four-fold greater than the normal population must be factored and discussed appropriately.
30 [53,54]
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34 Advanced age is also a matter of concern in candidates for pouch construction since
35 these patients are more likely to present significant medical comorbidities and impaired
36 sphincter function. Nevertheless, with an ageing population, the previous trend for considering
37 50 years as an age limit to offer IPAA needs to be far more nuanced.[18,21] Some studies have
38 been challenging this general recommendation, suggesting that IPAA could be offered as a
39 reasonable and safe option for elderly patients,[55,56] however, there is still uncertainty
40 surrounding this issue. The ongoing recommendation in the proposed checklist for patients
41 older than 55 years of age is to use an individualised and shared decision-making process to
42 define which patients are suitable for IPAA, considering the sphincteric integrity/function,
43 comorbidities, and the scope for preoperative clinical optimisation and prehabilitation.[57]
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47 Obesity has been traditionally approached with caution, with concerns regarding
48 limitation in mesenteric length due to the distribution of adipose tissue at the root of the
49 mesentery, consequently generating higher tension at the anastomosis and diverting ileostomy.
50 [3,27,58] Patients with obesity who undergo IPAA are more likely to have worse intraoperative
51 outcomes, such as longer operation time and greater blood loss, higher rate of open access, and
52 also higher overall postoperative complications.[28] Besides that, obese patients are more likely
53 to present decreased quality of life and higher chances of long-term pouch failure.[27]
54 Therefore, the recommendation in the preoperative evaluation is to encourage patients with a
55 BMI greater than 30kg/m² to lose weight before consideration for surgery.
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58 Another source of concern that must be addressed in the preoperative period is
59 exposure to radiation therapy. Pelvic irradiation, pre- or postoperative, may result in bowel
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3 tissue damage, potentially affecting the pouch function.[57] It is also associated with chronic
4 pouchitis and pouch failure.[47]
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6 A diagnosis of Crohn's disease (CD) is one of the principal causes of pouch failure. A
7 significant minority of patients believed to be UC undergoing IPAA will subsequently exhibit a
8 Crohn's phenotype during follow-up. A significant proportion of these patients will result in
9 eventual pouch excision and a permanent stoma.[59] Recently, Fadel and collaborators, using a
10 systematic review and meta-analysis of seven studies comprising 1,274 patients, have identified
11 that young age at UC diagnosis and pouch surgery, short duration of UC, family history of IBD,
12 and previous smoking are potential preoperative risk factors for overturning the diagnosis in
13 favour of CD after IPAA.[59] The proposed checklist addresses this through a broader
14 preoperative screening, investigating for potential clinical, radiological, endoscopic, and
15 histopathological features of CD that may have been overlooked.
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19 A meticulous perineal examination is an important step to investigate for potential CD
20 type features. Perianal disease is frequent amongst CD patients, occurring in up to 50% during
21 their lifetime and sometimes as a first manifestation. Perianal fistulae are the most common
22 type of anal involvement, with reported incidence rates of approximately 30%, followed by
23 abscesses, fissures, skin tags, and strictures.[60] Therefore, previous episodes or the presence
24 of these findings on physical examination in a patient that is a potential IPAA candidate should
25 be a 'red flag' to the possibility of underlying Crohn's disease.
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28 It is also important to address the extra-intestinal manifestations (EIMs) in the
29 preoperative evaluation of patients undergoing pouch surgery. EIMs are associated with poor
30 prognosis and decreased quality of life, and some manifestations can also be predominantly
31 associated with CD than with UC.[61] Of particular note, primary sclerosing cholangitis (PSC) is
32 associated with a greater risk of postoperative pelvic sepsis, pouchitis, and pouch
33 dysfunction/failure.[62–64]
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36 Recent evidence suggests that preoperative negative findings on CT/MR enterography
37 may not be a reliable predictor for the development of CD-like pouch complications.[65] Small
38 bowel capsule endoscopy may confer superiority in demonstrating inflammation in the small
39 bowel, but resources may constrain the ability to undertake this examination for all pouch
40 candidates. The current practice in the preoperative evaluation of patients that are candidates
41 for pouch construction at St. Mark's Hospital is to perform CT or MRI enterography initially
42 together with faecal calprotectin examination. If there is any suspected area of inflammation in
43 the small bowel or a raised faecal calprotectin or other clinical suspicions, such as weight loss
44 and persistent iron deficiency, the investigation is supplemented with capsule endoscopy.
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48 As a referral centre, we recommend a careful review of all previous endoscopic
49 examinations and histopathology. In addition to differentiating between CD and UC, the
50 preoperative endoscopic assessment of the severity of proctitis may be fundamental in some
51 cases to evaluate the possibility of undertaking an ileorectal anastomosis rather than IPAA, since
52 this option can be offered for highly selected patients who have a compliant and inflammation-
53 spared rectum.[3] It must be acknowledged that the histological features of IBD are influenced
54 by the duration of the disease and the implemented treatment. So correlating the clinical picture
55 with histological evaluation is essential.[66] Accordingly, the checklist recommends that all
56 available endoscopic biopsy and surgical specimens from candidate patients are reviewed by
57 two expert GI pathologists to exclude Crohn's disease pre-operatively.
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3 Pre-operative planning is essential. It is necessary to be aware of the technical aspects
4 of prior surgery since this may portend potential technical difficulties during pouch construction.
5 Knowledge of the location of the rectal stump is important, as it could have been left closed in
6 the abdomen, exteriorized as a mucous fistula, or placed subcutaneously. Another fundamental
7 piece of information is the extent of small bowel previously resected and the current length left
8 in situ, since pouch construction requires approximately 30-40cm of ileum, and any additional
9 small bowel resection may risk short-gut and consequent intestinal failure.
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12 Assessment of risk factors aside, the checklist is also useful to guide pre-operative
13 counselling. It encourages shared decision-making and full informed consent. Moreover, it
14 engages other members of the multidisciplinary team, such as the pouch and stoma nurses in
15 the pre-operative counselling and prompts discussion and exploration of alternatives to IPAA.
16 Stoma and pouch nursing services are essential for colorectal surgery units that aim to become
17 pouch referral centres. Specialist nurses play a fundamental role by providing informative and
18 supportive care, assisting the patient from the preoperative period through to postoperative
19 long-term follow-up, helping in the prevention of and management of long-term complications
20 and any problematic functional outcomes.[67] It is highly recommended that the patient be
21 referred as early as possible for preoperative sessions with the pouch/stoma specialist nurse.
22 These sessions should be extended to the patient's family or support network and may have to
23 be repeated as necessary, to ensure the patient is physically and mentally prepared. At our
24 institution, patients are also provided with a guidebook[68] that covers a wide range of topics,
25 including stoma care, dietary and lifestyle considerations, support mechanisms as well as
26 offering practical assistance for managing potential complications.
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31 In current practice, the majority of IPAAAs are constructed with stapled anastomosis
32 resulting in retention of a cuff of remnant rectal mucosa, which is susceptible to long-term
33 complications such as inflammation and dysplasia.[69] On the other hand, when it is necessary
34 to perform mucosectomy and hand-sewn anastomosis, the patient may face poor functional
35 outcomes such as faecal incontinence.[70] Therefore, it is important to address these potential
36 outcomes, as well as the need for regular post-operative endoscopic requirement with the
37 patient during pre-operative counselling and allay any doubts and concerns pre-emptively.
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40 Finally, the last checklist component is the MDT discussion. IBD management is complex
41 and demands inter-disciplinary involvement to enhance the patient care pathway,[71] making
42 the MDT discussion an essential step in the decision-making process. The assessment of all the
43 previous items in the checklist would facilitate the MDT discussion and enable a more
44 comprehensive deliberation of the suitability of the patient by the MDT participants, therefore
45 completion of the checklist prior to MDT discussion is recommended. At our institution, we host
46 a specialist Pouch MDT on a monthly basis.
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49 The limitations of this work are related to the lack of formal validation of the checklist.
50 Despite using an iterative and consensus process to develop the checklist, the construction of
51 the tool was based on the feedback and experience of the clinicians of a single specialised pouch
52 surgery centre. Moreover, the list of risk factors associated with pouch failure, functional
53 outcomes and complications in pouch surgery was derived from a narrative review, which
54 presents a methodological drawback in comparison to systematic reviews. Most of papers
55 included in the review were also either retrospective or involved retrospective analysis of
56 prospective database. Further formal validation through user feedback from other centres,
57 patient feedback, and assessment of the impact of the checklist on outcomes leading to further
58 amendments are expected.
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Conclusion

The decision-making process and preoperative assessment in pouch surgery is complex and involves multidisciplinary management. The procedure is intended for restoration of intestinal continuity but when undertaken injudiciously, or poorly executed it can potentially have major repercussions upon quality of life. Through an iterative and consensus-based process, this work has presented a preoperative checklist to support clinicians on the selection of patients that are suitable for IPAA. Moreover, the checklist offers a tool to assist the comprehensive discussion of cases in the multidisciplinary team meetings. Further studies are needed to validate and analyse the impact of the checklist on IBD practice.

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Tables**Table 1.** *Surgical options for patients with Ulcerative Colitis*

Restorative procedures	Non-restorative procedures
Total proctocolectomy with ileal pouch-anal anastomosis	Total proctocolectomy with end ileostomy
Total colectomy with ileorectal anastomosis	Total proctocolectomy with continent ileostomy

Table 2. Studies addressing preoperative risk factors for intraoperative and postoperative complications after ileal pouch-anal anastomosis (IPAA); BMI=Body Mass Index, sSSI= superficial surgical site infection, ASA= American Society of Anaesthesiologists score, LOS= length of stay, UTI= urinary tract infection, PSC= primary sclerosing cholangitis.

Author, year	Study design	Patients (n)	Outcome	Statistically significant risk factors
Leeds et al[27], 2022	Retrospectively propensity score-matched, prospectively collected cohort	3300	Longer operating time	Obesity (BMI \geq 30 Kg/m ²)
Duraes et al[18], 2022	Retrospective	601	sSSI	Age > 70 years
Frese et al.[6], 2021	Case-control	391 patients (26 with failed IPAA)	Intraoperative failed IPAA	Male gender, arterial hypertension, extraintestinal manifestations, ASA III, elevated BMI, and elevated prednisolone daily dose
Abd El Aziz et al[29], 2021	Propensity score-matched analysis	2158	Postoperative organ/space infection	Obesity (BMI \geq 30 Kg/m ²)
Ray et al[42], 2020	Retrospective cohort	3150	Postoperative morbidity	Hypoalbuminemia (<3.5g/dl) and weight loss (>10% in prior 6 months)
Poh et al[7], 2020	Retrospective cohort	1438 patients (1288 UC patients)	Intraoperative failed IPAA	Male gender, obesity (BMI \geq 30 Kg/m ²), two-stage procedure
Bong et al[41], 2020	Retrospective cohort	73 patients undergoing elective two-stage restorative proctocolectomy	30 day postoperative complications	Current smoking, open surgery.
Horio et al[8]	Retrospective	165	Pouch-related complications within 30 days (bleeding, leakage, anastomotic stricture)	Male gender, BMI \geq 25Kg/m ²

Mckenna et al.[30], 2018	Retrospective cohort	4049	Organ space infection	Urgent surgery, obesity (BMI \geq 30 Kg/m ²)
Mckenna et al[9], 2018	Retrospective cohort	911	Longer operation time, intraoperative blood loss, LOS	Male gender
Mckenna et al[31], 2017	Retrospective cohort	909	Operation time, intraoperative blood loss, likelihood to have open surgery, sSSI, UTI	Obesity (BMI \geq 30 Kg/m ²)
Colombo et al[19], 2017	Case-control	231 (74 patients >65 years and 154 patients < 65 years)	Clavien-Dindo IV-V complications, longer LOS	Advanced age (\geq 65 years)
Fujikawa et al[40], 2017	Retrospective	69	Surgical site infection	Sarcopenia
Khasawneh et al[32], 2016	Retrospective cohort	1046	Intraoperative failed IPAA	Obesity
Klos et al[33], 2014	Retrospective	178	Anastomotic/pouch strictures, inflammatory pouch complications, pouch fistulas	Obesity (BMI \geq 30 Kg/m ²)
Canedo et al[34], 2010	Case-control	65 obese patients (55 UC) and 65 nonobese (57 UC)	Longer operative time, longer LOS, higher rate of incisional hernia	Obesity (BMI \geq 30Kg/m ²)
Uchino et al[37], 2010	Retrospective	192	Incisional surgical site infection	ASA \geq 3, preoperative use of corticosteroids
Kiran et al[35], 2008	Retrospective	2016	Wound infection, anastomotic separation	Obesity (BMI \geq 30Kg/m ²)
Gorgun et al[63], 2005	Case-control	65 patients with PSC and, 260 IBD patients with no associated PSC	Postoperative pelvic sepsis	Primary sclerosing cholangitis

Table 3. Studies addressing preoperative risk factors for pouch failure; BMI=Body Mass Index, IPAA= ileal pouch-anal anastomosis, ASA= American Society of Anaesthesiologists score

Author, year	Study design	Patients (n)	Pouch failure (%)	Statistically significant risk factors
Ricardo et al.[44], 2023	Retrospective cohort	664	6.2%	Pre-colectomy biologics use, Crohn's disease like pouch inflammation, pouch revision
Leeds et al. [27], 2022	Retrospectively propensity score-matched, prospectively collected cohort	3300	4.4%	Obesity (BMI \geq 30 Kg/m ²)
Frese et al.[38], 2022	Case-control	334	16.5%	Severe proctitis at the time of IPAA, pouchitis, pouch fistula, ASA III
Duraes et al[18], 2022	Retrospective	601	3.5%	Age > 70 years, pelvic sepsis, fistula, mucosectomy with handsewn anastomosis
Lightner et al[15], 2022	Retrospective	566	19.4%	Female gender, 3-stage surgery, pelvic sepsis
Kolbeinsson et al[45], 2022	Retrospective	380	12.4%	De novo Crohn's disease
Helavirta et al[10], 2020	Retrospective	491	10.8%	Male gender, leakage
Die et al[20], 2020	Retrospective	139	32%	Age > 50 years, handsewn anastomosis, pouch fistula
Mark-Christensen et al[11], 2018	Retrospective cohort	1991	14.8%	Female gender, primary non-diversion, low volume hospital
Uchino et al[46], 2017	Retrospective	2376	4.2%	Crohn's disease like pouch inflammation
Wu et al[47], 2013	Retrospective	63 patients with colitis-associated cancer who	20.6%	Preoperative pelvic radiation

		underwent IPAA		
Wu et al[36], 2013	Retrospective analysis of prospective database	846	8%	Excessive weight gain after ileostomy closure ($\geq 15\%$ increase)
Rottoli et al[12], 2011	Retrospective	3407	5.9% in female, 4.7% in male	Female gender, Crohn's disease
Wibmer et al[26], 2010	Retrospective	185 patients (141 UC patients)	8.6%	Advanced age (> 60y)
Tulchinsky et al[13], 2003	Retrospective	634	9.7%	The final diagnosis of Crohn's disease, "S" reservoir, female gender, postoperative pelvic sepsis, one-stage procedure

Table 4. Studies addressing preoperative risk factors for decreased functional outcomes and quality of life after ileal pouch-anal anastomosis (IPAA). BMI=Body Mass Index, ASA= American Society of Anaesthesiologists score

Author, year	Study design	Patients (n)	Outcome	Statistically significant risk factors
Leeds et al[27], 2022	Retrospectively propensity score-matched, prospectively collected cohort	3300	Global quality of life	Obesity (BMI \geq 30 Kg/m ²)
Lightner et al[15], 2022	Retrospective	566	Urgency, seepage during the day	Advanced age (\geq 80 years)
Li et al[17], 2022	Cross-sectional	128	Ileoanal pouch syndrome	Male gender, preoperative duration of disease
Khera et al[43], 2020	Retrospective	46	Poor pouch function	Preoperative nocturnal faecal incontinence
Jonker et al[70], 2020	Retrospective	65 (57 IBD patients)	Poor faecal continence	Mucosectomy with handsewn anastomosis, increasing age
Mckenna et al[22], 2018	Retrospective	911	Daytime incontinence, pad usage	Advanced age (> 50 years)
Watanabe et al[23], 2017	Questionnaire survey	79	Daily bowel movements, nocturnal bowel movements	Advanced age (\geq 45 years)
Xu et al[24], 2017	Retrospective	58	Poor long-term quality of life	Advanced age
Abolfotouh et al[39], 2017	Retrospective	485	Worse quality of life	Preoperative hypertension and age \geq 35 years
Ramage et al[21], 2016	Systematic review	4840 patients	Increased 24-h stool frequency, daytime, and night-time incontinence rates	Advanced age (> 50 years)
Pavlidis et al[62], 2014	Case-control	100 patients (21 PSC patients)	Poor nocturnal pouch function	Primary sclerosing cholangitis
Brandsborg et al[16], 2013	Questionnaire survey	1047	Higher rates of urgency, frequency of	Female gender

			bowel movements, pad usage	
Rottoli et al[12], 2011	Retrospective	3407	Higher rates of daily bowel movements, urgency, seepage, and pad use. Dietary and work restrictions	Female gender
Chapman et al[25], 2005	Retrospective	2002	Faecal incontinence	Advanced age (>55 years)

Confidential: For Review Only

Figures

Figure 1. Restorative proctocolectomy with ileal pouch-anal anastomosis for ulcerative colitis.

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Figure 2. Flow chart illustrating the process of literature search and study selection.

Figure 3. Preoperative assessment checklist for ileal pouch-anal anastomosis (IPAA) procedure in Ulcerative Colitis.

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Abbreviations

CD: Crohn's disease.

EIMs: extra-intestinal manifestations.

IBD: inflammatory bowel disease.

IPAA: ileal pouch-anal anastomosis.

ITU: urinary tract infections.

LOS: length of stay.

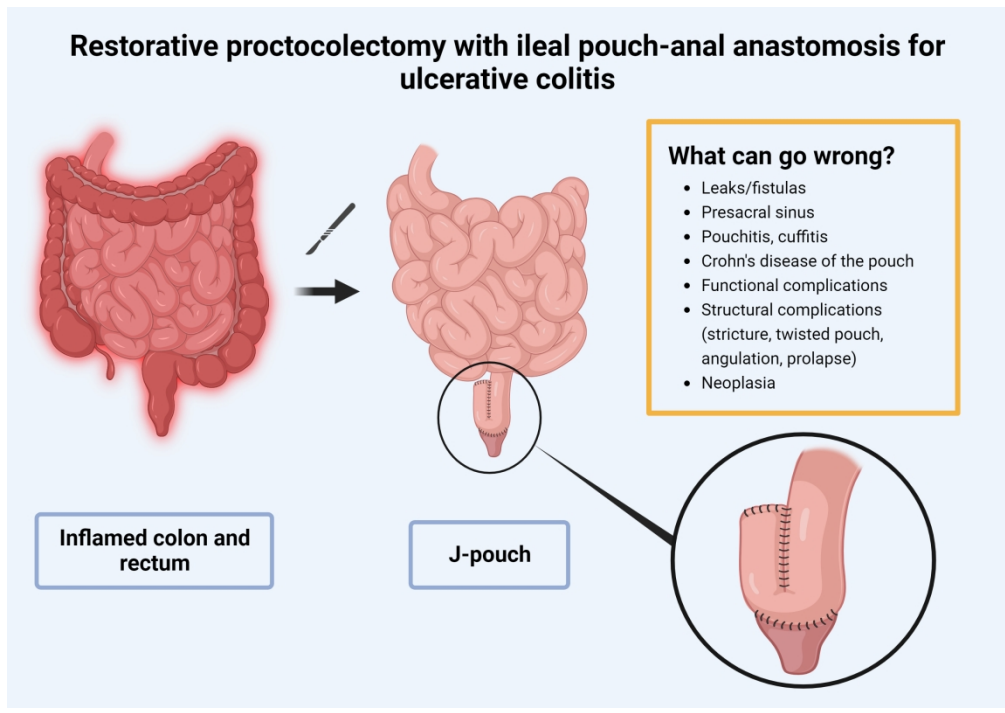
MDT: multidisciplinary Team.

PSC: primary sclerosing cholangitis.

sSSI: superficial surgical site infections.

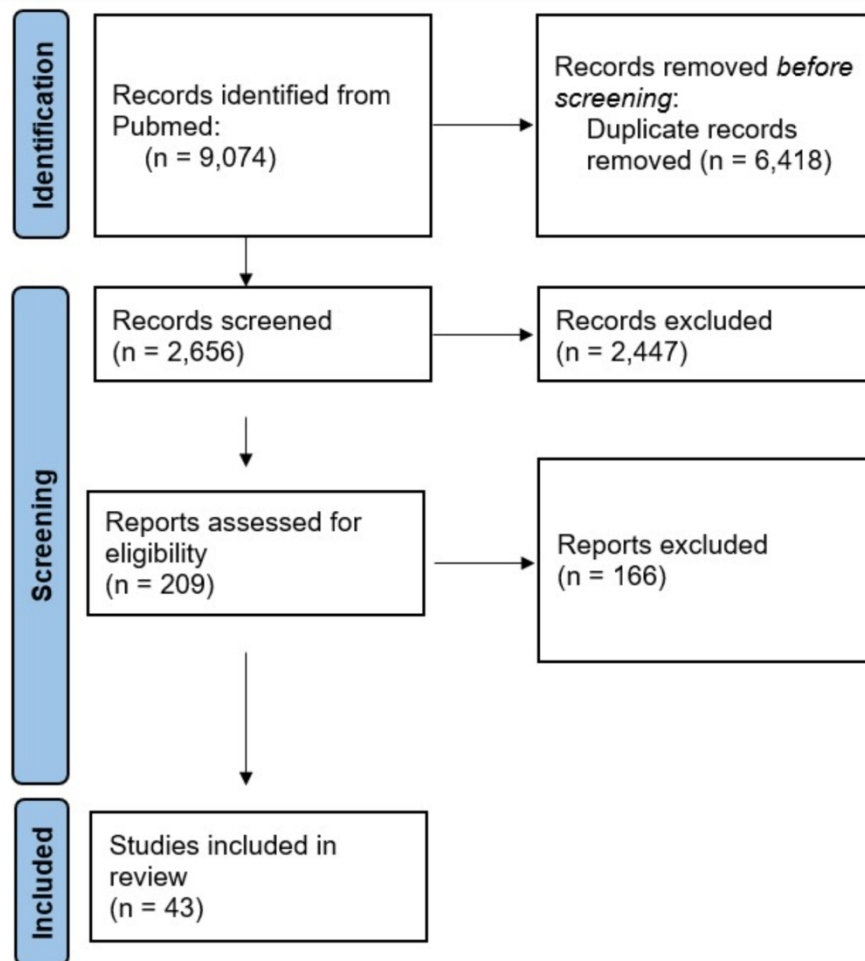
UC: ulcerative colitis.

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Restorative proctocolectomy with ileal pouch-anal anastomosis for ulcerative colitis.

254x177mm (300 x 300 DPI)



Flow chart illustrating the process of literature search and study selection

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Preoperative assessment checklist for IPAA procedure in ulcerative colitis

1- Indication for surgery

2- Age ⚠ If ≥55y

3- Gender Male Female

4- Comorbidities Yes No

⚠ Is there any room for clinical/nutritional optimisation?

5- BMI ⚠ If ≥ 30Kg/m² → encourage weight loss

6- Sphincter integrity and function
 Good function Poor function and/or suspected sphincteric impairment

7- Disease characteristics (assessing the risk of underlying Crohn's disease)

a. Perianal disease Yes No

b. Extra-intestinal manifestations Yes No

c. Small bowel study CTE MRE Capsule endoscopy

d. Stoma calprotectin

e. Review of previous colonoscopies Yes No

f. Secondary pathology review Yes No

8- Previous operations Yes No
 Length of small bowel in situ, length of small bowel resected, previous pelvic surgery, placement of the rectal stump

9- Previous or planned pelvic radiation therapy Yes No

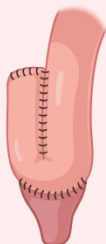
10- Endoscopic evaluation of the rectum to assess for active inflammation
 Degree of proctitis (Mayo score) → Discuss medical therapy optimisation

11- Discussion regarding surgical options (ileorectal anastomosis, end ileostomy, or continent ileostomy) ✓

12- Planned mucosectomy Yes No

13- Pouch and stoma care nursing counselling ✓

14- IBD/Pouch MDT discussion ✓



Preoperative assessment checklist for ileal pouch-anal anastomosis (IPAA) procedure in Ulcerative Colitis

253x379mm (300 x 300 DPI)