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ECCO Topical Review

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# ECCO Topical Review Optimising Reporting in Surgery, Endoscopy, and Histopathology

## *Collaboration Between S-ECCO, EduCom, H-ECCO*

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### Abstract

**Background and Aims:** Diagnosis and management of inflammatory bowel diseases [IBD] requires a lifelong multidisciplinary approach. The quality of medical reporting is crucial in this context. The present topical review addresses the need for optimised reporting in endoscopy, surgery, and histopathology.

**Methods:** A consensus expert panel consisting of gastroenterologists, surgeons, and pathologists, convened by the European Crohn's and Colitis Organisation, performed a systematic literature review. The following topics were covered: in endoscopy: [i] general IBD endoscopy; [ii] disease activity and surveillance; [iii] endoscopy treatment in IBD; in surgery: [iv] medical history with

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surgical relevance, surgical indication, and strategy; [v] operative approach; [vi] intraoperative disease description; [vii] operative steps; in pathology: [viii] macroscopic assessment and interpretation of resection specimens; [ix] IBD histology, including biopsies, surgical resections, and neoplasia; [x] IBD histology conclusion and report. Statements were developed using a Delphi methodology incorporating two consecutive rounds. Current practice positions were set when ≥ 80% of participants agreed on a recommendation.

**Results:** Thirty practice positions established a standard terminology for optimal reporting in endoscopy, surgery, and histopathology. Assessment of disease activity, surveillance recommendations, advice to surgeons for operative indication and strategies, including margins and extent of resection, and diagnostic criteria of IBD, as well as guidance for the interpretation of dysplasia and cancer, were handled. A standardised report including a core set of items to include in each specialty report, was defined.

**Conclusions**: Interdisciplinary high-quality care requires thorough and standardised reporting across specialties. This topical review offers an actionable framework and practice recommendations to optimise reporting in endoscopy, surgery, and histopathology.

**Key Words:** Endoscopy; surgery; pathology; inflammatory bowel disease [IBD]; reporting

## 1. Introduction

Inflammatory bowel diseases [IBDs], including ulcerative colitis [UC] and Crohn's disease [CD], are lifelong disorders, which consume a large share of health care resources and may cause long-term disability. Although predominantly present in the developed world, incidence is rising worldwide and now reaches a global prevalence above 0.3%.[1–3] No cure is available with the exception of a minority of UC patients who opt for radical surgery.

An interdisciplinary, multiprofessional, holistic approach, involving among others clinicians and pathologists, is paramount to ensure the best possible management and outcomes in IBD patients. Indeed, a sound pathology diagnosis is a prerequisite to the contemporary management of IBD in all its breadth and depth, including medical, interventional, and surgical treatment options. Patients undergo regular endoscopies to determine the extent and activity of their disease and response to medical treatment, as well as screening and surveillance of dysplasia and neoplastic lesions.[4] The clinician relies on the pathologist to inform and manage the patient's care and to direct his/her actions. This is true along the lifespan of all IBD patients, since more than 50% of patients with CD will undergo surgery because of disease complications[5] and up to 20% of patients with UC will undergo a colectomy.[6] Accordingly, the information contained in the reports of endoscopy, surgery, and pathology is crucial for the quality of care delivered and experienced by patients. However, to date, there has not yet been a formal effort to move towards a standardied reporting process for endoscopy, surgery, and histopathology in IBD. Despite the large number of scores available, none is widely used, and essential information is often not communicated in these reports [eg, the location and depth of ulceration at endoscopy or the length of the remaining small bowel at surgery]. Moreover, whereas expert centres have a dedicated IBD multidisciplinary team proficient in the interpretation of biopsies and specimens, the vast majority of IBD patients are taken care of outside expert centres. Therefore, standardisation of reporting in IBD endoscopy, surgery, and pathology will allow for a comprehensive interpretation framework and a shared understanding across medical reports and providers. Moreover, standardisation is critical for facilitating comparison of research data.

The present topical review aims at establishing a standard terminology for the elaboration of trusted reports in endoscopy, surgery, and histopathology. These involve, among others, diagnostic criteria of IBD, interpretation guidance for dysplasia and cancer, surgical indication and strategies including margins and extent of resection, assessment of disease activity, and reminder of surveillance recommendations. Beyond the mere number of core items to include in each report, standardisation of terminology is emphasised. It is hoped that the provision of actionable practice recommendations by an interdisciplinary group of experts of the European Crohn's and Colitis Organisation [ECCO] will prove useful in daily care of IBD patients.

## 2. Methods

A pressing need for guidance in reporting standards was identified by ECCO and led to the present work. Strong evidence is missing in this important field, hence gathering consensus agreement from a large interdisciplinary panel of experts was deemed optimal to address this important clinical need in daily practice. An open call for a topical review on optimising reporting in surgery, endoscopy, and pathology was announced to all ECCO members under the leadership of the Surgeons [S-ECCO] and Histopathologists [H-ECCO] of ECCO and the oversight of the Guideline Committee. A total of 16 individuals were selected based on their expertise, accomplishments, and commitment. Balance was ensured between medical specialists, gender, and geography. Each of three working groups [WG] focused on a specific topic, as follows. WG1 [endoscopy] focused on [i] general IBD endoscopy statements; [ii] endoscopic disease activity and surveillance reporting in IBD; [iii] endoscopy treatment in IBD. WG2 [Surgery] focused on [iv] medical history with surgical relevance, surgical indication, and strategy; [v] operative approach; [vi] intraoperative disease description; [vii] operative step. WG3 [Pathology] focused on [viii] the macroscopic assessment and interpretation of resection specimens for IBD; [ix] IBD histology, including biopsies, surgical resections, and neoplasia; [x] IBD histology conclusion and report. Each WG performed a systematic literature search of their topics using Medline/Pubmed, Embase, and the Cochrane database, in addition to their own files. Each WG discussed the retrieved literature and formulated draft current practice positions and supporting text.

The current practice positions were further developed using a Delphi methodology incorporating two successive rounds. The first round was web-based with anonymous voting, and explicitly asked

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for feedback and suggestions to be included into the iterative development of the statements. The second and final round was a dedicated expert web meeting on 18 September 2020, with discussion and completion of the consensus document. Current Practice Positions were accepted when ≥ 80% of participants agreed to the text of the statements. The WG leaders and their respective members then finalised the supporting text. The final manuscript was edited for consistency by the two project coordinators and by the Guideline Committee representative before a final review and approval by all involved experts.

## 3. Current Practice Positions

### 3.1. Endoscopy

#### Section 1. General IBD Endoscopy Statements

**ECCO Current Practice Position 1.1**

The endoscopic report should clearly and concisely describe all relevant medical and endoscopic technical information, findings, therapeutic intervention, adverse events, conclusions, and recommendations

Various quality initiatives and guidelines have defined minimum standard terminology[7] as important prerequisite for a 'good'-quality endoscopy reporting, effective communication, and quality assurance. Box 1 presents key quality indicators for a good endoscopy report.

General information about disease characteristics,[8] such as phenotype, indication for the procedure [assessment or surveillance], inflammatory bowel diseases [IBD] therapy, symptoms, and examination characteristics should be included in the pre- and intraprocedural report, as suggested by European Society of Gastrointestinal Endoscopy [ESGE] for non-IBD patients.[9]

The report should be electronic and clearly describe all technical aspects such as sedation, as well as details of endoscopes and devices used such as standard definition [SD] or high definition-white light endoscopy [HD-WLE], dye-chromoendoscopy (DCE [eg, indigo carmine or methylene blue]), or virtual electronic chromoendoscopy (VCE [eg, iSCAN, Narrow Band Imaging-NBI or Blue Laser Imaging -BLI]), and any advanced imaging technique magnification, confocal laser endomicroscopy [CLE], endocytoscopy, or artificial intelligence, including technical specifications [type, dilution, setting].

Other technical aspects should also be considered, such as quality of bowel preparation based on validated scales [eg, Boston Bowel Preparation Scale], overall duration of the procedure [eg, anus-to-anus time], withdrawal time, digital anorectal examination and perianal inspection [particularly in perianal Crohn's and cuff diseases], extent of examination [including maximal extent of or reason for failure of ileal intubation], retroflexion in the rectum, technical limitations, adverse events, incidents, and patient tolerance.[8–13]

Description of the main endoscopic findings using validated endoscopic scores, endoscopic improvement or worsening compared with previous examination, and therapeutic intervention should be documented.[8]

Conclusion and follow-up plan should be reported, including next clinical appointment, next surveillance colonoscopy according to risk stratification changes in therapy, and further imaging recommended.[14] Finally, photo documentation or video recording is a reporting requirement.

The extent and degree of inflammation should be described using standardised terminology, including changes in vascular pattern, erythema,

**Box 1. Key quality indicators for a good report in endoscopy.**

**Pre-procedure features**
- Indication
- Characteristics of the disease [phenotype, treatment, symptoms]
- Bowel preparation [volume, split]
- Sedation [anaesthesiology assistance]
- Overall duration
- Endoscopic instrument [HD, NBI, iSCAN or BLI]
- Solutions [indigo carmine, methylene blue] and concentration
- Devices settings

**Intra-procedure features**
- Digital anorectal examination and perianal inspection
- Retroflexion in the rectum
- Extent of examination
- Bowel preparation
- Technical limitations
- Withdrawal time
- Adverse event or incident
- Patient tolerance
- Activity of the disease
  - MES, UCEIS, or PICaSSO for UC
  - SES-CD, CDEIS, or Rutgeerts score for CD
  - PDAI for pouch
  - Lewis, CECDAI, or Niv score in VCE
- Biopsies [localisation and number]
- Detection, characterisation of lesion [Five 'S' and FACILE]
  - Shape
  - Size
  - Site
  - Surface
  - Surrounding area
- Treatment [EMR, ESD, balloon dilatation, electro-incision, stricturotomy, stents]
- Photo documentation and video recording

**Post-procedure features**
- Conclusion
- Follow-up

UC, ulcerative colitis; CD, Crohn's disease.

#### Section 2. Endoscopic Disease Activity and Surveillance reporting in IBD

**ECCO Current Practice Position 2.1**

The endoscopic activity of each segment should be described using both reproducible terms related to degree of inflammation and standardised endoscopic scores

oedema, erosions, aphthous ulcers, ulcers, bleeding, strictures,[7] and validated scores.[8,11] For colonoscopy in ulcerative colitis [UC] patients, the Mayo Endoscopic Score [MES] is simple and widely used; validated scores are the Ulcerative Colitis Colonoscopic Index of Severity [UCCIS] and the Ulcerative Colitis Endoscopic Index of Severity [UCEIS].[15] These scores have characteristics in common, such as vascular pattern, bleeding, and erosions and are easy to calculate. The use of advanced endoscopic imaging techniques [eg, VCE, magnification,] should be reported and the activity of the disease described according to newly developed, validated, and reproduced scores [eg, PICaSSO [Paddington International Virtual ChromoendoScopy ScOre][16] for VCE use in UC]. For colonoscopy in

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Crohn's disease [CD] patients, both the Crohn's Disease Endoscopic Index of Severity [CDEIS] and the Simple Endoscopic Score for Crohn's Disease [SES-CD] are validated and reproducible.[15] However, SES-CD is a simpler version of CDEIS and more used in clinical practice. It evaluates presence of ulcers and their size, the ulcerated and affected surface involved, and the presence of strictures defined as inflammatory, fibrotic, single, or multiple and if they can be passed. All these endoscopic findings should be incorporated in the report.[17]

In CD patients with a history of ileocolonic resection, the report should include both neoterminal ileum and anastomotic inflammatory changes with descriptors [number of aphthous ulcers, size of ulcers, presence of passable or non-passable strictures] and also by the Modified Rutgeerts score.[18] Inflammation in other colonic segments, if present, should be assessed and also reported according to the CDEIS or SES-CD. The report should specify localisation, type [random or targeted], and number of biopsies to assess the histological inflammatory activity.[14]

For wireless capsule endoscopy [WCE], the report should include standardised terminology and scoring system (Lewis, Capsule Endoscopy Crohn's Disease Activity Index [CECDAI], or Niv score), completeness of procedure including all landmarks [eg, first image of stomach, duodenum, caecum, large bowel landmarks, excretion] and transit times [eg, gastric, small bowel, and large bowel transit time], visibility, the results of either patency tests or previous enteroscopy/enterography, ongoing treatments, and the use of non-steroidal anti-inflammatory drugs in the past 4 weeks.[19–22]

**ECCO Current Practice Position 2.2**

The adopted endoscopic imaging technique, such as DCE [eg, indigo carmine or methylene blue] or VCE [eg, iSCAN, NBI or BLI], including technical specifications [eg, type, dilution, setting], any suspected lesion, and the amount and location of biopsies should be described

DCE should be performed in patients with quiescent colitis and optimal bowel preparation and described in term of dye [eg, indigo carmine or methylene blue] and dilution.[23] The dilution changes for the detection and characterisation of lesions, for indigo carmine from 0.03% to 0.13% and for methylene blue from 0.04% to 0.2%, should be specified in the report.[14,23,24] VCE should be described in terms of type [eg, iSCAN, NBI, or BLI] and setting.[24] ESGE recommends the routine use of either DCE or VCE with targeted biopsies, after proper training, for neoplasia surveillance in IBD.[14,24] Standardised and validated classification, such as modified Paris classification[23] for morphology of the lesion, Kudo pit pattern[25] for surface, and the more recent FACILE [Frankfurt Advanced Chromoendoscopic IBD Lesions] classification,[26] including both morphology and surface, should be considered. For characterisation of colonic lesions, we propose the 'Five S' features in the report with photo-documentation,[9] as illustrated in Figure 1. These include: Site and localization, Size [using biopsy forceps as reference standard], Shape [polypoid, non-polypoid, or lateral spreading tumour, distinct or indistinct borders;], presence of ulcers],[23] Surface [Kudo pit pattern[25] or FACILE classification][26] and Surrounding [mucosal activity, colitis area/non-colitis area, or other lesions in surrounding area]. The amount, locations, and random or targeted biopsies should be specified in the report. Targeted biopsies are recommended[14,24] when DCE or VCE is performed.[23] However, quadrantic random biopsies are still suggested when WLE is used or in addition to DCE-driven targeted biopsies in high-risk patients (personal history of colorectal dysplasia, tubular appearing colon, and primary sclerosing cholangitis [PSC]).[27] In capsule endoscopy reports, an accurate endoscopic description by means of the Smooth, Protruding lesion Index on Capsule Endoscopy [SPICE] score,[28] and/or the Shyung score[29] [for protruding neoplasms lesions or innocuous mucosal bulges], and the clinical relevance of the findings [ie, the predicted significance of observed lesions, especially in those referred with suspected small bowel bleeding] should be included.

Pouchoscopy reporting should include an evaluation of distensibility of the pouch body and the severity, extent, and distribution

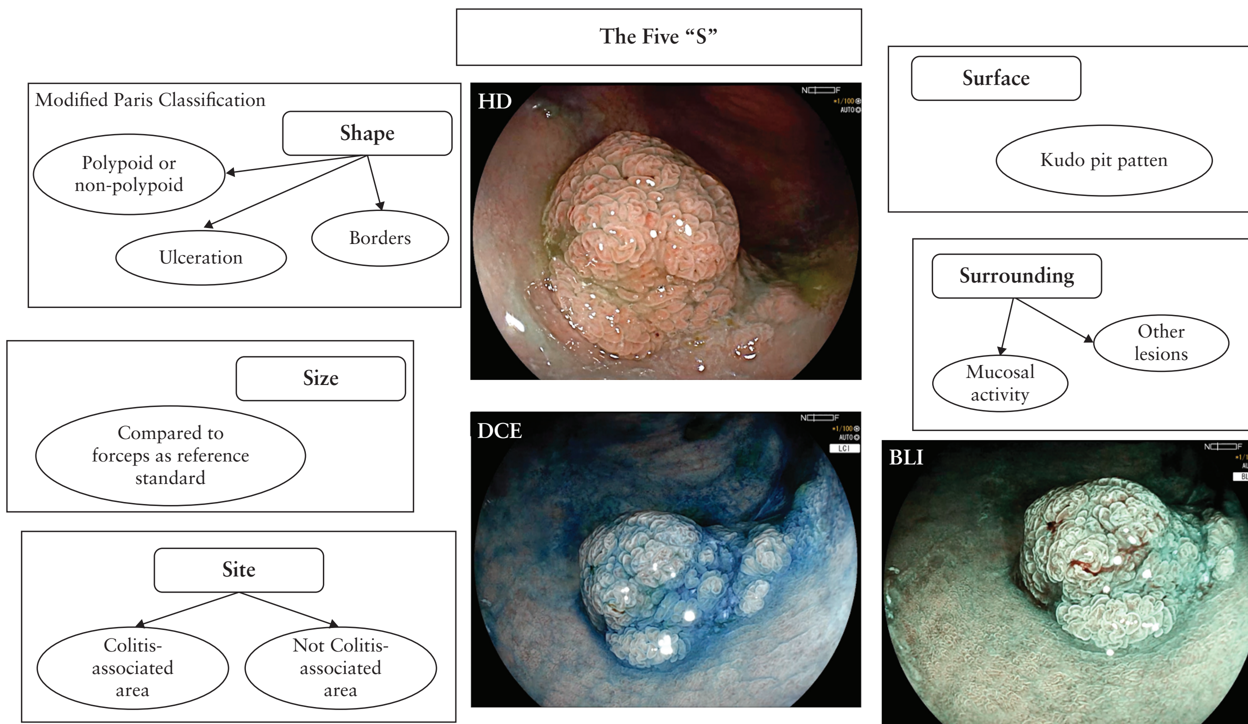


Figure 1. Photo-documentation of colonic lesions taking advantage of the 'Five S' features in the report.

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**ECCO Current Practice Position 2.3**

When performing pouchoscopy for disease activity or surveillance, the endoscopic report should specify the maximal distance of intubation and describe all pouch landmarks and endoscopic findings

of mucosal inflammation to the maximal distance, prepouch ileal intubation [or rationale for failure of intubation], and description of all pouch landmarks including cuff [if present], pouch body, pouch junction/inlet, and pre-pouch ileum.[8] The endoscopic items as subscore of PDAI [oedema, granularity, loss of vascular pattern, friability, mucous exudate, ulceration], the most used score for diagnosis and measurement of disease activity, should be reported.[30,31]

For pouchoscopy surveillance, which should start 1 year after the pouch closure and continue according the risk stratification,[4,32] the cuff and all areas of the pouch should be accurately inspected, as dysplasia can frequently occur in the afferent limb, pouch body, and the vast majority in the rectal cuff.[33–35] Multiple biopsies are recommended; however, high definition endoscopy with targeted biopsies is preferred if available.[32,36,37] If a lesion is detected, it should be characterised with the 'five S features' and classifications described for colonic lesions.[23] If it is resected, the technique should be accurately described.[32,36,37] If a pouch stricture is detected, it should be accurately described, in particular if it is passable or non-passable, and the endoscopic treatment if any should be included in the report.[38,39]

**Section 3. Endoscopy Treatment in IBD**

**ECCO Current Practice Position 3.1**

The report should include detailed description of the endoscopic resection technique, completeness of removal, and retrieval of the resected specimen

Technical specification of resection should be reported, such as use of hot or cold snare, endoscopic mucosal resection [EMR],[40,41] endoscopic submucosal dissection [ESD],[42,43] or hybrid or cap-assisted EMR/ESD.[44] Additionally, if submucosal injection is used, the details should be included in the report. The colonic site of the lesion after the resection should be described in the report, alongside the surrounding area.[23] Biopsies from non-resected lesions or from mucosa surrounding lesions should be detailed and sent to the pathologist in a separate pot.[23,45]A tattoo should be performed at least 2–3 cm distally from resected and non-resected dysplastic lesions on the anal side and described in the report.[11]

**ECCO Current Practice Position 3.2**

The report should include detailed description of digestive stricture combining clinical, endoscopic, and radiological data and the history of previous endoscopic dilation. A technical description of the endoscopic treatment of the stricture and the endoscopic outcome, as well as the post-procedural prescription and follow-up, should be reported

Standardisation of reporting on endoscopic treatment of IBD-related stricture can be challenging because of underlying disease factors or anatomical alterations, medical therapy, previous surgery, and comorbidities.[46]

Preprocedural details should include the presence of symptoms, the type of stricture and indication, previous diagnostic endoscopies and radiological examinations used to characterise the stricture[s], the technical feasibility of endoscopic treatment, and history of previous endoscopic interventions.[47–57]

Intraprocedural information should be clearly disclosed, including the description of the stricture type [inflammatory, fibrotic, and if could be passed], the technique [balloon dilation, electroincision, stricturotomy, stricturoplasty, stent placement][58] together with technical specification[48,51,54] [eg, the size of balloon, the graded dilation, the use of wire-guide, anterograde or retrograde orientation of the scope, the duration of balloon insufflations], the procedure in detail [clip placement, type of knife, mode of incision such as endocut mode, and type of stent such as fully covered removable metal stent].[59–61]It is also important to report if biopsy of the stricture was taken to rule out malignancy.[48] Post-interventional information should include endoscopic outcomes [mucosal tearing, bleeding, stricture passable or not], incidents or adverse events, and post-procedural care [eg, medications, timing of feeding, diet restriction, endoscopic or radiological follow-up].[59–61]

## 3.2. Surgery

Standardisation of reporting is paramount in surgery for IBD, as patients may require surgical care across a long time span and/or being referred to an expert centre. Adherence to key quality indicators in surgical reporting [Box 2] ensures that surgeons who care for the patient have an exact description of the surgical situation and field at hand on which to base their advice and decision making.

**Section 4. Medical History With Surgical Relevance**

**ECCO Current Practice Position 4.1**

Demographics, nutritional status, medical and surgical treatment, obstetric history, and relevant imaging [endoscopy, radiology] are reported

Preoperative evaluation includes past and current medication, including dosage, duration, and last administration. Corticosteroids and anti-tumour necrosis factor [TNF] agents are associated with higher risk of postoperative complications.[62,63] Malnutrition/weight loss, anaemia, smoking, and perforating disease[64–70] are risk factors to address before surgery and/or may indicate a stoma rather than an anastomosis.[71–73] Extent and behaviour of CD is investigated by preoperative ileocolonoscopy and magnetic resonance imaging [MRI] enterography,[64,74] describing the amount of inflamed/stenosed bowel and of non-affected bowel.[75,76] Computed tomography [CT] or ultrasonography can document abscesses and fistulas.[62] An endoscope, a marble, or a catheter can help evaluate the bowel lumen and identify strictures.[63,77,78] Toxic megacolon or perforation on imaging are reported and may indicate emergency surgery, being related to higher mortality and postoperative morbidity.[77,78] Age and gender matter, as younger and male patients have more severe disease and higher rate of colectomy and pouchitis.[64–68] Obesity (body mass index [BMI] $\geq 30$) is correlated with an increased rate of surgical complications[68,69] including anastomotic leak. The Montreal classification is useful to report,[70] as disease severity is associated with dysplasia and cancer[71,72] and also with the development of pouchitis.[73] Dysplasia and carcinoma should trigger appropriate oncological resections.[69,70]

**ECCO Current Practice Position 4.2**

The surgical indication and strategy are stated considering the clinical situation

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### 3.3. Surgical indication and strategy

The ECCO and the American Society of Colon and Rectal Surgeons have published guidelines for the surgical management of CD and UC, clearly defining the indications for surgery.[66,79] Stating the surgical indication also allows comparison of the preoperative indication and the intraoperative findings and whether the surgery was adapted. The surgical strategy is included in the report: stricturoplasties, segmental resection to proctocolectomy, and [staged] restorative procedure.[66,79] In UC, one- and two-stage procedures are often chosen in elective situations, whereas modified two-stage or three-stage procedures are generally selected when patients present risk factors and higher disease activity, and in emergency cases.

**Section 5. Operative Approach**

**ECCO Current Practice Position 5.1**

The accessibility of the peritoneal cavity is documented, noting the extent and severity of adhesions and the approach used: open, laparoscopic or robotic, and any reason to convert

The surgical approach is detailed: open, laparoscopic, or robotic platform and number and type of ports. Presence and extension of adhesions are mentioned, as adhesions are associated with postoperative ileus.[80] Any treatment used to solve or minimise adhesions [eg, sodium hyaluronate and carboxymethylcellulose] should be stated. Previous surgery and complications should be reported, as these can influence future CD-related surgery or the various stages of UC-related surgery.

**Section 6. Intraoperative Disease Description**

**ECCO Current Practice Position 6.1**

A detailed description of the extent and phenotype of disease [CD: small bowel, ileocolic, colon, rectum, perianal; UC: perianal/proctitis, left-sided colitis, pancolitis, ileal involvement] is required, including location in regard to anatomical landmarks [Treitz, ileocaecal valve, previous anastomosis, rectosigmoid junction, dentate line]. The lengths of the unaffected small bowel, colon, and rectum are reported

The length of healthy/remaining small bowel is reported. The occurrence of short bowel syndrome increases dramatically when the remaining small bowel approaches 100 cm in patients with a jejunostomy or ileostomy, or 50 cm in patients with the colon in place.[81] Laparoscopic measurement of the small bowel length is inaccurate, with substantial interindividual variability, compared with measurement during laparotomy.[82] Recent studies have related the risk of short bowel syndrome more to perforating CD, short small bowel before CD diagnosis, and surgical complications, rather than multiple resections.[83,84] Intraoperative enteroscopy provides additional information and may change the surgical procedure in up to 48% of repeat surgeries and 52% of patients having an abdominal abscess or fistula at time of surgery.[24]

Important findings in UC include evidence of free perforation [faeculent or purulent peritonitis, abscess], typically secondary to acute toxic colitis/toxic megacolon or colonoscopy.[81,82] Severe intestinal haemorrhage has an incidence between 0% and 6%[85,86] in cases of pancolitis with diffuse ulcerations. Finally, any perianal suppurative lesions and fistulas should be noted. Although these lesions are less common than in CD, if present they are correlated with higher disease activity.[81] A validated endoscopic activity score for CD should be reported.[16,17,87] Reporting the extent and activity of the illness is important, as acute severe UC has a higher mortality rate.[81] A validated endoscopic activity score for UC should be reported.[16,87]

**ECCO Current Practice Position 6.2**

Length and type of obstructive disease [inflammatory or fibrostenotic stricture], proximal bowel dilation, presence of skip lesions and relation to the main affected bowel are reported. Length and position of the operated bowel segment[s] in regard to anatomical landmarks are described. When stricturoplasties are performed, the number, type, and length thereof are mentioned

The presence, number, and location of isolated macroscopic skip lesions is reported and correlated with preoperative findings. Intraoperative ultrasonography has been shown to minimise intraoperative assessment variability; when used, technical details and findings should be added to the report.[88,89]

**ECCO Current Practice Position 6.3**

Location and type of perforating disease [phlegmon or fistulous] are reported together with the involvement of other abdominal structures [small bowel, colon and rectum, urogenital, hepatobiliary, abdominal wall/retroperitoneal], and the presence of undrained sepsis/abscess. An interpretation of whether a bowel segment is primarily or secondarily affected is useful. When a resection is performed, the fate of the bystander organ/structure is described [suture, wedge, or segmental resection]

A phlegmon can contain different bowel loops and structures. The description of the perioperative findings should explain the surgical strategy. All fistulas should be defined and sepsis drained.[79] Most often, the bystander organ does not need resection and the fistula can be closed with sutures or wedge resection.[90] The need for a resection of the bystander organ should be described. Bowel-sparing procedures are detailed and any decision to perform or not an anastomosis explained.

**ECCO Current Practice Position 6.4**

The extent and severity of colorectal involvement, in particular whether the rectum is spared and compliant, and whether there is active perianal disease should be described. The state of the terminal ileum and the type of colorectal resection performed are stated

It is important to note the condition of the terminal ileum and rectum in UC. Patients with colonic disease and rectal sparing may undergo segmental colectomy. When the right colon is spared, it may be brought through an ileal mesenteric window to allow a traction-free anastomosis or be turned upside down to allow an ascendo-rectostomy [Deloyer's procedure].[91] Subtotal colectomy may be necessary when the remaining colon is too short. When the condition

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of the rectum precludes an anastomosis, its fate should be described [closure or exteriorised as a mucous fistula].

> **ECCO Current Practice Position 6.5**
>
> This incudes the location of perianal disease in regard to the dentate line and description, including scars, severity of proctitis, strictures; and description of fistulas: length, course, branches, relation to the sphincter complex and genital structures, location and number of internal and external openings, presence of undrained sepsis/abscess, position of seton drainage

Perianal disease represents an aggressive phenotype of CD and warrants adequate surgical and medical treatment.[92] Description includes the type and number of fistulas and, equally important, the presence of active luminal disease/proctitis, stricture, and undrained sepsis.[93] This description guides the multidisciplinary approach and allows definition of achievable outcomes for the patient. Digital photo documentation is a valuable addition to evaluate treatment response.

**Section 7. Operative Steps**

> **ECCO Current Practice Position 7.1**
>
> Regarding the dissection technique: close bowel, broad mesentery/vascular control, or oncological mesenteric dissection, and the margins of disease-free bowel are reported. Any frozen section taken is mentioned. Visualisation and preservation of autonomic nerves [periaortal, presacral] is noted. The fate of the omentum is described: left intact, partial or total removal; also description of the need for diversion, type of diversion, and any reinforcement/mesh placement

Macroscopic margin length and quality are reported. Histological margins and plexitis may be later included as risk factor for recurrence.[94–97] Close bowel resections is used in CD unless dysplasia/cancer is present. Preliminary data suggest that the resection of the mesentery may postpone surgical recurrences and mesorectal removal perineal sinuses in CD.[98–101] Guidelines recommend oncological lymphadenectomy with central ligation in case of preoperative diagnosis of dysplasia/cancer.[65,102]

During colectomy for UC, the level of vessel ligation[103,104] is reported, as it is relevant at the time of subsequent completion proctectomy or revisional pouch surgery. Reporting the vessel ligation method [tie, Hem-O-Lok, clips, staplers, transection with energy devices] can inform imaging during follow-up.[98] Preservation or extent of removal of the omentum is reported, as it may influence postoperative sepsis and bowel obstruction.[99–101]

> **ECCO Current Practice Position 7.2**
>
> The type, construction, and location of anastomosis are described. Anastomotic testing, drainage, and/or reinforcement are detailed

Type [end-to-end, end-to-side, or side-to-side iso- or antiperistaltic], level [small bowel, colocolic, ileorectal, ileopouch-anal] and technique of anastomosis [hand-sewn and layers, or single-/double-stapled] are described. Assessment of perfusion, air leak test, ring integrity, and omental wrapping is reported.[65,105,106] Innovative anastomotic approaches [ileocolic nipple valve anastomosis] aim at preventing bacterial reflux from the colon to the neoterminal ileum[107] or at excluding the mesentery [Kono-S].[108]

Ileopouch-anal anastomosis [IPAA] is most commonly performed in UC. Regarding the anastomosis technique: double stapled, hand-sewn, or transanal[109–112] is reported, as are the type, size, and number of cartridges used. An ileorectal anastomosis [IRA] may also be used, depending on the associated risk-benefit compared with the IPAA.[113,114] The rationale for choosing an IRA/IPAA should be documented.

The anastomosis height in regard to the dentate line must be documented, as the optimal level lies 1-2 cm above the dentate line and a retained rectal stump of > 2cm is associated with cuffitis and dysplasia.[110] Anastomosis testing, the presence of a potential leak, incomplete anastomotic rings, and the salvage procedure performed should be reported.

> **ECCO Current Practice Position 7.3**
>
> The management of the rectal stump and of any rectal tube is detailed. The number and type of stapler cartridges closing the rectum, any oversewing and marking stiches, the length of the stump,[115] and the extent/type of any mesorectal dissection are detailed

Three options are available for the management of the rectal stump.[102,116]

- open/formal mucous fistula;
- closed subcutaneous mucous fistula/closed rectal stump;

intraperitoneal division and closure of the rectum.

The positioning of the closed/open mucous fistula should be reported [midline incision, left iliac fossa, or ileostomy-site].[65,117]

A mucous fistula or a rectal tube may protect from intrabdominal spillage[118] and from blowout of a closed rectal stump. Their postoperative management should be mentioned.

> **ECCO Current Practice Position 7.4**
>
> Description of the restorative procedure includes type of pouch [J, W, H, or S], length of pouch limbs/type and amount of stapler cartridges used, and orientation of the mesentery. Mesentery lengthening technique and vascular consideration are reported

IPAA is the standard restorative procedure following proctocolectomy. Many pouch configurations have been described, with no proven long-term benefit favouring any technique.[109,119–122] Yet the J-pouch has become the preferred option for its simplicity, reliability, and limited use of ileum. Lengthening techniques to address failure of the J-pouch to reach down are described: mobilisation and incision of the small bowel mesentery, division of the ileocolic vessels, vein graft to the superior mesenteric artery, or any other technique.[110,123]

### 3.4. Histopathology

Indications for resection in UC include refractory disease, intolerance of medical therapy, and neoplasia. Indications in Crohn's disease are similar, including stenosis [small bowel > large bowel].

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**Box 2. Key quality indicators for a good report in surgery.**

| | |
|---|---|
| **Preoperative** | |
| Demographic and clinical characteristics | Age |
| | Gender |
| | Nutritional status |
| | Previous medications |
| | Smoking |
| | Disease phenotype [including relevant examination findings] |
| | Previous surgery and related complications |
| | Oncological information [if applicable] |
| | Montreal classification |
| Surgical indication | Indication |
| | Staged procedure |
| **Intra-operative** | |
| Surgical approach | Type of surgical approach [laparoscopic, robotic, transanal, open] |
| | Number and sites of port |
| | Description of dissection method |
| | Type, number, indication, and location of anastomosis |
| | Anastomosis height in regard of dentate line |
| | Anastomotic testing, drainage and/or reinforcement description, status of the rings |
| | Pouch configuration and description |
| | Description of diversion technique |
| | Frozen sections |
| Disease description | Presence, extension, and management of adhesions |
| | Location, extension, and phenotype of disease |
| | Length of unaffected bowel |
| | Length and type of obstructive disease |
| | Presence of skip lesions |
| | Presence of proximal bowel dilatation |
| | Number, type, and length of strictureplasties |
| | Location, type, and management of fistulas and phlegmons |
| | Status and management of the rectum |
| | Description of perianal disease |

## Section 8. The Macroscopic Assessment and Interpretation of Resection Specimens for IBD

**ECCO Current Practice Position 8.1**

Macroscopic description of a resection specimen should include identifiable classical features and any unusual macroscopic distribution patterns, eg, caecal patch, rectal sparing, and ileitis in ulcerative colitis

The macroscopic description should record the points shown in [Box 3].[124–126]

Optimal preparation and fixation are imperative. Resection specimens are ideally received fresh and intact for proper orientation, and otherwise should be already completely immersed in formalin.[124,127,128]

Specimens are opened along the antemesenteric border for complete fixation except when visible/suspected tumour is identified, in which case that segment is ideally left unopened.[125] Where orientation is not possible, eg, matted segments and/or narrow strictures, the bowel may be sliced transversely. Fixation for at least 48 h is recommended.[124,127,129] Photographs are useful for block annotation, clinicopathological meetings, and correlating findings with microscopy.[124,125]

If there is diffuse visible disease and suspected dysplasia, sequential sampling at intervals of 10 cm or less is recommended, including suspicious lesions.[124,129] Samples of macroscopically normal bowel may be informative, particularly in CD.[124,129] Although there are conflicting opinions, sampling of longitudinal

**Box 3. Macroscopic description of a resection specimen.**

**Specimen**
- Type
- Measurements

**Serosa/fat:**
- Perforation and fistulas
- Exudate
- Adhesions
- Thickness of mesentery; fat wrapping

**Mucosa**
- Extent and distribution of disease
- Ulcers: appearance; size if discrete
- Polyps
- Status of margins

**Wall**
- Thickening, thinning
- Dilatation
- Strictures [location, number, length]
- Fibrosis
- Necrosis

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**ECCO Current Practice Position 8.2**

All resections need systematic gross examination, including photography. The specimen is opened longitudinally along the antemesenteric or antemesocolic border for fixation [except at the site of any carcinoma], and samples are then collected [including lymph nodes, terminal ileum, and appendix when present]

resection margins is advisable and allows assessment of disease activity.[124,130,131] Longitudinal sections of bowel are preferable to transverse.[124,129] Lymph nodes should be sampled, but it is not necessary to embed all nodes.[124,127,129]

## 3.5. Biopsies in IBD

**Section 9. IBD Histology**

**ECCO Current Practice Position 9.1**

For optimal diagnosis of inflammatory bowel disease, a minimum of two biopsies from the ileum and each colon segment, including the rectum, should be sampled to allow assessment of disease distribution

In suspected new IBD, at least two biopsies from terminal ileum, four different colonic segments, and rectum, with separate collection and step-sectioning, are necessary. Biopsies are from abnormal non-ulcerated areas, or from normal areas if there is no mucosal abnormality. In fulminant colitis, sampling is limited to two biopsies, with one biopsy from the edge of an ulcer to exclude cytomegalovirus [CMV]. During follow-up, biopsies are limited in number. Clinicians should always state the anatomical site of origin of biopsies.

Surveillance for early detection of dysplasia is recommended, using chromo-endoscopy with targeted biopsies.[125]

In children, an oesophagogastroduodenoscopy is standard. Focally enhanced gastritis may support a diagnosis of IBD, and a higher potential yield of granulomas increases the likelihood of a definitive CD diagnosis.[132]

## 3.6. Histological description of IBD

In very early-stage UC, the mucosa shows preserved architecture without transmucosal inflammation. Basal plasmacytosis is a diagnostic feature, distinguishing IBD from infection.[133,134] Neutrophils may infiltrate the surface or crypt epithelium, causing cryptitis and crypt abscesses.[135] In time, a diffuse, continuous, and transmucosal mononuclear infiltrate develops from the rectum, diminishing in severity proximally.[136] This induces crypt distortion with branching and atrophy and/or a villous mucosa.[133] There may be flattened mucin-depleted epithelium, erosions, and flat ulcers.[137] Other features of chronicity include Paneth cell metaplasia in the left colon.[138] In long-standing disease, patchiness and rectal sparing may be secondary to treatment.[136,139] Architectural changes may persist despite clinical remission. New-onset UC in children may cause less severe crypt distortion and inflammation with unusual patterns such as rectal sparing and patchiness.[140]

Diagnostic features of CD are a discontinuous or focal chronic inflammation with focal crypt irregularity and granulomas. An early sign is an aphthoid ulcer. The intensity of the inflammation varies within and between biopsies and extends into the submucosa in a disproportionate way. Chronic inflammation in the ileum may induce pseudopyloric metaplasia [23%].[141] Cryptitis, and less commonly crypt abscesses, represent disease activity. Granulomas, which are more prevalent at a young age, strongly favour CD over UC but are not a prerequisite for diagnosis.[142] In UC, granulomas are only present in association with ruptured crypts.[143] In CD resections, transmural inflammation with lymphoid aggregates, fissuring ulcers, fistulas, and neuronal and fibromuscular hypertrophy are characteristic [Table 1].[144,145] Plexitis at margins may predict recurrence.[94,96,130,146–149] In contrast to adults, colitis is more prevalent than ileitis in children with CD. Upper gastrointestinal [GI] involvement with focally enhanced gastritis [76%] and duodenitis [48%] is more common in CD than in UC [21% and 29%, respectively].[150]

**ECCO Current Practice Position 9.2**

Microscopic diagnosis of inflammatory bowel disease is based on architectural changes and distribution of inflammation. Whereas ulcerative colitis shows diffuse mucosal inflammation, Crohn's disease shows a transmural, discontinuous inflammatory process with focal crypt irregularities, eventually associated with granulomas

In very early-onset IBD [VEOIBD], ie, at < 6 years of age, CD [60%] is more prevalent than UC [33%], but to a lesser extent than in the older-onset paediatric population [74% vs 24%, respectively].[151] Distinct histopathological findings include more severe chronic architectural changes, frequent small intestinal villous blunting, diffuse eosinophilic mucosal infiltration, and an increase in epithelial cell apoptoses.[152]

Microscopic features characteristic for ulcerative colitis and Crohn's disease are reported in Table 1.

**ECCO Current Practice Position 9.3**

The features that most strongly support a diagnosis of IBD in a biopsy are basal plasmacytosis and architectural changes. UC and CD have distinctive features

Histological confirmation of IBD and histological distinction between UC and CD in practice may be difficult, even in resections [Box 4, 5].[153]

## 3.7. Neoplasia in IBD

Colorectal IBD patients have a 1.5- to 2-fold increase in the risk of colorectal carcinoma, although there may be a recent decline.[154–157] Risk factors include severity of endoscopic inflammation, acute/active histological inflammation, and chronic histological inflammation [Box 5].[154,158–163] Dysplasia is the precursor lesion, is often multifocal, and is the best and most reproducible marker for cancer risk.[164–167]

With advances in endoscopy, most IBD dysplasia is endoscopically visible.[168] The SCENIC [Surveillance for Colorectal Endoscopic Neoplasia Detection and Management in Inflammatory Bowel Disease patients: International Consensus] nomenclature proposes classification of dysplasia as [i] visible, if identified and removed or sampled by targeted biopsies, or [ii] invisible, if present in random biopsies.[169] Visible lesions are classified further as polypoid or non-polypoid.[170] Some pathologists use the term 'IBD-associated dysplastic lesion' for non-sporadic lesions.

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**Table 1.** Microscopic features characteristic for ulcerative colitis and Crohn's disease.

| | | Ulcerative colitis [UC] | Crohn's disease |
|---|---|---|---|
| Mucosal architecture | Crypt irregularity | Diffuse/continuous | Focal/discontinuous |
| | Ulcers | Flat | Fissuring |
| Chronic inflammation | Distribution | Diffuse/continuous | Focal/discontinuous/variable |
| | | Transmucosal → submucosa | Transmural |
| | | Proportionate submucosal | Disproportionate submucosal |
| | | Distal colon → proximal | Ileum → colon |
| | Basal plasmacytosis | Present | Present |
| | Lymphoid aggregates | Transmucosal → submucosa | Transmural |
| Active inflammation | Lamina propria | Diffuse/continuous | Focal/discontinuous |
| | Cryptitis | Diffuse/continuous | Focal/discontinuous |
| | Crypt abscesses | Common, more numerous | Less frequent |
| | Serositis | Absent [except in fulminant colitis] | May be present |
| Granulomas | | Cryptolytic only | Common |
| Epithelial changes | Mucin depletion | Present, pronounced | Mild |
| | Paneth cell metaplasia | May be present | May be less common than in UC |
| | Pseudopyloric metaplasia | Uncommon | Present [small bowel] |
| Mesenchymal changes | Fibrosis | Uncommon [mucosa and submucosa] | Common [transmural] |
| | Muscular hypertrophy | Muscularis mucosae | Muscularis mucosae<br>Muscularis propria |
| | Neuronal hypertrophy | Rare | Common |

Classification as low-grade dysplasia [LGD] and high-grade dysplasia [HGD] is based on both cytology and architecture. Unclassifiable atypia is termed 'indefinite for dysplasia'. There is significant inter- and intra-observer variability, notably for LGD,d indefinite for dysplasia.[125,171–173] Therefore, confirmation by an expert gastrointestinal pathologist is usually recommended and we support this approach strongly.[125,173]

**Box 4. Reasons for diagnostic difficulties.**

**General**
- Suboptimal sample / processing / clinical details
- Very early IBD
- Quiescent IBD
- Histological mimics of IBD
- Co-existing additional disease

**Ulcerative colitis vs Crohn's disease**
- Cryptolytic granulomas in UC
- Discontinuity in UC, eg, rectal sparing, periappendiceal patch, post-treatment discontinuity
- Severe inflammation in resections for UC, resulting in CD-like features
- Genuinely unclassifiable IBD

IBD, inflammatory bowel disease; UC, ulcerative colitis; CD, Crohn's disease.

**ECCO Current Practice Position 9.4**

Dysplasia is the best marker for cancer risk in IBD

The previous WHO [2010] classification identified three subtypes of IBD dysplasia: intestinal, hypermucinous/villous, and serrated. However, there is much overlap.[174–176] 'Serrated epithelial change' is a controversial and variably defined entity.[177–179]

CD carries an increased risk of small bowel adenocarcinoma [SBA].[180–182] CD-associated small intestinal dysplasia is present in 50-69% of SBA resections.[181,183,184]

**ECCO Current Practice Position 9.5**

Classification as low-grade dysplasia and high-grade dysplasia depends on cytological and architectural criteria. The category 'indefinite for dysplasia' is appropriate for cases in which a distinction between non-neoplastic changes and dysplasia cannot be made [eg, poor quality sample; severe inflammation; confusing histological features]

The structure of the conclusion should be consistent. The acronym 'PAID' is one option,[134] [Pattern, Activity, Interpretation, and Dysplasia].[164] It is important for the pathologist to know if the IBD is new or treated.

When classification of IBD as UC or Crohn's disease is not possible, the term 'inflammatory bowel disease unclassified' is applicable to biopsies, whereas 'indeterminate colitis' is applicable only to resections.[185,186]

There are many different criteria for recognising and grading histological activity in IBD. The approach depends partly on the circumstances [ie, diagnostic work or clinical trials]. Pathologists may rely on individual features or combinations of changes. For UC, structured scoring schemes include the modified Geboes score, Robarts histopathology index, and Nancy histology index. The Nancy index is relatively easily applicable in practice and is well validated.[187–190] For Crohn's disease, the available schemes may be difficult to apply. In general, there is little agreement on definitions of histological features.[134,190]

**ECCO Current Practice Position 9.6**

Because of significant inter- and intra-observer variability, confirmation of dysplasia and its grade by an expert gastrointestinal pathologist is strongly recommended

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**Box 5. Clinical risk factors for colorectal neoplasia [CRN] in inflammatory bowel disease-associated colitis.**[158]

**Disease-related factors:**
Extensive colitis
Duration of disease
Severity of inflammation
Cumulative inflammatory burden
Structural alterations [pseudopolyps, stricture, and shortened, tubular colon]
**Patient-related factors:**
Previous history of CRN
Family history of colorectal cancer [especially if < 50 years old]
Primary sclerosing cholangitis
Possible: earlier age of disease onset, male sex

### 3.8. Conclusion of IBD biopsy report

**Section 10. IBD Histology Conclusion and Report**

**ECCO Current Practice Position 10.1**

The conclusion of an IBD biopsy report should have a consistent structure, eg, pattern of changes, activity, interpretation of changes, and dysplasia ['PAID']

- Pattern:
    - chronic changes, with distribution and extent;
    - granulomas;
    - CMV if relevant.
- Activity:
    - grade [consider formal score for UC, eg, Nancy index];
    - location.

**ECCO Current Practice Position 10.2**

If distinction between UC and CD is not possible, the terms 'IBD unclassifiable' or, after examination of a resection specimen, 'indeterminate colitis' are applicable

- Interpretation in new IBD:
    - IBD vs non-IBD:

**ECCO Current Practice Position 10.3**

The conclusion of an IBD biopsy report requires interpretation of the histology based on whether the patient has suspected new IBD or treated IBD

        - definite/probable IBD or IBD favoured over other causes or no definite evidence of IBD.
    - UC vs CD:
        - definite/probable UC or definite/probable CD or UC more likely or CD more likely or IBD unclassified.
- Interpretation in treated IBD:
    - degree of support for known diagnosis.

**ECCO Current Practice Position 10.4**

The conclusion of an IBD resection report should confirm a diagnosis of IBD, determine the type of IBD [where relevant], and comment on disease distribution, activity, and neoplasia

- Dysplasia
    - grade and location[s].

### 3.9. IBD resections: conclusion

The 'PAID' structure remains broadly applicable for colonic resections. In a small bowel resection for stricture, exclusion of other causes is important.

### 3.10. IBD large bowel resection conclusion

- Pattern of changes, including extent;
- activity;
- margin status;
- interpretation:
    - confirmation of IBD;
    - type of IBD, i.e. UC or CD or favouring UC/CD or 'indeterminate colitis';
- neoplasia.

### 3.11. IBD small bowel resection conclusion

- Confirmation of Crohn's disease;
- severity of changes;
- margin status;
- exclusion of alternative causes of stricture;
- neoplasia.

## 4. Discussion

The present topical review addresses an unmet need in the care of IBD patients: it establishes a set of core elements to ensure optimal recording, communication. and quality assurance, which altogether allow for a clinically useful report within and across the fields of endoscopy, surgery, and histopathology. Synoptic and structured standardised reporting improve report completeness[191] and contribute to ensuring high quality of care.[192] Noteworthy, these 30 current practice positions were established by an interdisciplinary panel of 16 experts with 100% agreement within and across disciplines. A large consensus was hence reached, and it will contribute to promoting an effective communication between the different specialties that take care of IBD patients, both in expert centres and in non-expert centres.

In addition to establishing a core set of items to include in each report, this topical review proposes a uniform, standardised terminology which takes advantage of validated classification and scoring systems in UC and CD. Indeed, using commonly accepted terminology improves communication between health care providers for the benefit of the IBD patient. In addition, the present topical review contributes to standardising the accrual and interpretation of biopsies and specimens.

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The expert panel focused on key subjects of clinical relevance, including:

- identification of key quality measures in endoscopy practice, ie, optimal bowel preparation, ideal time allocation, sedation, training, extent of control of inflammation, detection and characterisation of lesions, therapeutic management of the lesions, and colonoscopic reports;
- from a surgical standpoint, description of the extent and type of disease [inflammatory, stenotic, fistulising], involvement of other organs, margins of disease-free bowel, and remaining small and large bowel. In presence of perianal disease, description of proctitis, strictures, course and length of anal fistulas in regard to the dentate line;
- diagnostic criteria and interpretation of dysplasia, histological confirmation of IBD, and distinction between UC and CD. For example, the term 'indeterminate colitis' is reserved for resection specimens and 'inflammatory bowel disease unclassified' for biopsies. A diagnosis of dysplasia always requires confirmation by a second pathologist with expertise in gastrointestinal pathology.

This work also identified further unmet clinical need, which warrants further research and development:

in endoscopy, the implementation of training modules is warranted to support standardisation in routine clinical practice and improve key quality performance of endoscopy in IBD;

in surgery, agreement on key quality performance indicators, including individual caseload to maintain proficiency;[193]

in histopathology, the need for a fully validated histological scoring index for evaluation of CD activity.

The present topical review has identified essential items to include in endoscopy, surgery, and pathology reports, to meet high standards of care for IBD patients. It also has provided a standardised terminology to improve communication and inform interdisciplinary management. It is hoped that these practice recommendations will provide actionable knowledge and prove useful in the daily care of IBD patients.

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## Conflict of Interest

ECCO has diligently maintained a disclosure policy of potential conflicts of interests [CoI]. The conflict of interest declaration is based on a form used by the International Committee of Medical Journal Editors [ICMJE]. The CoI statement is not only stored at the ECCO Office and the editorial office of *JCC*, but 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 authors.

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## Supplementary Data

Supplementary material: literature tables as a separate file are available at *ECCO-JCC* online.

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