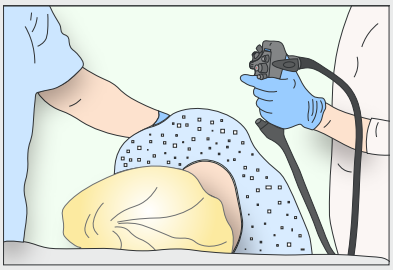
Mistakes in colonoscopy and how to avoid them

Manmeet Matharoo, Srivathsan Ravindran and Siwan Thomas-Gibson



Colonoscopy is a complex procedure requiring both technical and non-technical skills. Performing colonoscopy also requires manual and visuospatial skills, interpretation of pathology, patient communication and a wide range of advanced therapeutic technologies.

The clinical intention of colonoscopy must be individualised, and diagnostic and/or therapeutic intent rationalised, given the procedures invasive nature and associated risks.

Furthermore, each colonoscopy differs due to patient factors, sedation strategy, anatomical configuration, technical challenges and endoscopist skills. Endoscopists must, therefore, demonstrate a wide range of expertise whilst working effectively in a team to manage the patient safely. It is not, therefore, surprising that mistakes in colonoscopy can occur.

This article focuses on six common mistakes in colonoscopy that can be avoided to improve the procedure's safety and deliver a high-quality procedure. This, in turn, can reduce the rates of post-colonoscopy colorectal cancer (PCCRC) and improve patient experience and adherence to colonoscopy surveillance programmes.

This article is based on evidence in conjunction with our collective clinical and research experience of errors in endoscopy and patient safety

Mistake 1 Performing a colonoscopy on a patient who does not need it

Colonoscopy is an essential aspect of the investigation of colorectal disease. Judicious and selective use of colonoscopy for the right patient at the right time in the investigation pathway is vital. Multiple specialities in primary and secondary care settings can refer patients for colonoscopy. Considering the indication and referral information provided is crucial for determining if a colonoscopy will help answer the clinical question. Early discussion with an endoscopist will clarify this in grey areas, and suitable alternative investigations may be considered. These include CT colonography when the patient may be unable to tolerate colonoscopy and where colonic and extra-colonic findings are relevant, as well as flexible sigmoidoscopy for predominantly anorectal symptoms. Factors relevant to patient selection are summarised below (Table 1).

A robust pre-assessment process with knowledgeable and experienced nurses (ideally with a background in endoscopy) is invaluable in determining the patient's suitability for colonoscopy, where factors such as comorbidity, exercise tolerance, sedation issues and ability to comply with bowel preparation can be discussed in detail.[1]

Aside from the invasive nature of the procedure and protecting patients from the experience of an unnecessary colonoscopy, any complication, however 'minor', arising from a procedure that is not entirely indicated is more challenging to defend.

Furthermore, selectivity is critical in the post covid-19 era of managing the vast endoscopy backlog with limited endoscopy resources. This is reinforced by the green endoscopy agenda, where it is clear that the most impactful measure of our endoscopy carbon footprint is not doing a procedure when clinically inappropriate.[2]

Indications for colonoscopy can be divided into diagnostic, therapeutic and surveillance procedures. Whilst clinical judgement will always be required, a comprehensive list of indications is detailed in the BSG position statement [3] and summarised in the information box (figure 1).

Endoscopist's considerations for patient selection in colonoscopy	
Indication and vetting	• Appropriateness of the indication • Completeness of referral • MDT decisions/approach
Patient factors	• Co-morbidity • Exercise tolerance • ASA grading
Bowel preparation	• Appropriate prep for the procedure • Patient compliance
Alternative investigations	• Stool tests (Calprotectin, FIT) • CT colonography • Flexible sigmoidoscopy

MDT = Multidisciplinary Team; ASA = American Society of Anaesthesiologists

Table 1 | Endoscopist's considerations for patient selection in colonoscopy.

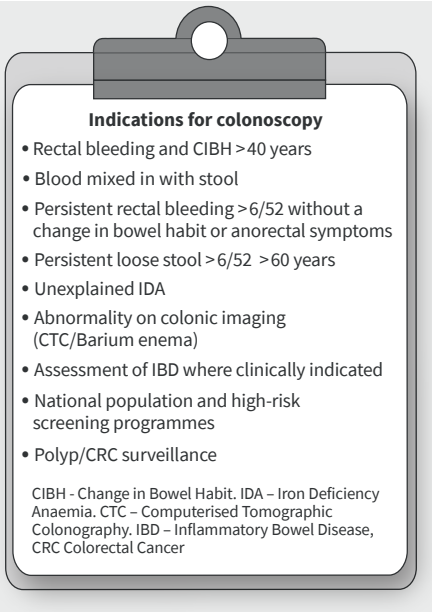


Figure 1 | Indications for colonoscopy.

Mistake 2 Not being present and engaged in the team briefing and endoscopy safety checklist

Planning and preparation are critical endoscopic non-technical skills (ENTS).[4] Non-technical skills complement technical skills in safe and effective

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performance and are cognitive, interpersonal and social skills. This is important at the point of referral, as outlined above, but also on the day of the procedure. There is growing evidence of the importance of team briefings and pre-procedural checklists in surgery and endoscopy.[5-8] This has been a relatively recent practice shift with varying degrees of engagement from the lead endoscopist. The team briefing is a crucial opportunity to pinpoint the pertinent details of the cases in the list with the endoscopy team and proactively deal with any issues that may impact the smooth running of the list and the safety and quality of the colonoscopy. Special situations relating to patient comorbidity and anti-coagulation can be highlighted to the team and consideration of the patient experience (i.e., sedation plan, surveillance procedure or advanced therapy). Importantly the team brief allows the endoscopist to clarify which specific equipment is needed to ensure this can be prepared on time. The importance of engaging and aligning the endoscopy team cannot be overstated. The briefing process enables the endoscopist to be receptive to new, critical, or changing information, set a 'Plan B' and flatten the team hierarchy by enhancing communication.

Once the team briefing is complete, the final safety net is the pre-procedural endoscopy safety checklist, notably with the patient present. This provides a final opportunity to re-confirm the patient's consent and manage their expectations before starting.[9]

These tools, in conjunction, can prevent avoidable errors and positively impact high-level teamwork if used effectively.

To close the loop, a team debrief at the end of a list, or even a complex case, will enable any issues to be rectified before continuing with subsequent cases.

Mistake 3 Rushing and using excessive force during intubation

Getting the intubation right is essential for setting the tone of the procedure both from the patient's perspective (particularly when un-sedated) and for any subsequent therapy. This is where the patient's anxiety and the opportunity to build trust and cooperation may be at their peak. Colonoscopy starts with a detailed digital rectal examination where anorectal pathology can be identified. This area historically performed poorly by gastroenterologists, and attention to perianal Crohn's disease and anal cancer, for example, are essential considerations.

The intubation also enables the endoscopist to determine the colonic phenotype (atonic and loopy or angulated and narrow), adequacy of the bowel preparation, patient tolerance, and make any necessary adaptations (change of scope or insertion technique). The endoscopist may proactively abandon the procedure and rearrange it with additional bowel preparation, an alternative sedation strategy, or an alternative test such as CTC or Double Balloon Endoscopy (DBE) to safeguard patient safety.

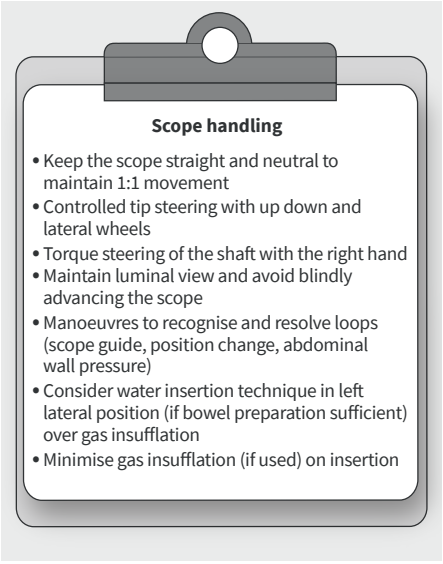

Figure 2 | Scope handling.

Rectal retroflexion can be performed at the procedure's beginning or end. This is an important quality metric for rectal cancer, considering evidence from studies examining PCCRC.[10] The main advantage of completing rectal retroflexion on insertion is the immediate identification of significant pathologies. It enables the endoscopist to contextualise more proximal colonic findings appropriately and plan any therapy accordingly. In addition, leaving rectal retroflexion until the end of extubation may
coincide with waning levels of sedation and possible discomfort for the patient.

There is sufficient evidence extolling the virtue of water insertion over carbon dioxide and the attendant benefits for patient comfort, loop prevention, and mucosal cleansing.[11,12] Similarly, loop prevention, recognition and resolution are vital technical skills to master. Optimising insertion technique is a crucial technical skill to train in, and key points are summarised in figure 2.[13]

Efficient intubation enables the endoscopist to spend proportionately more time examining the colonic mucosa on extubation and targeting any therapy. However, this must not be at the expense of the patient's comfort. The intubation enables the endoscopist to begin planning therapy, which must always be considered in conjunction with answering the clinical question. For example, is bowel preparation good enough for surveillance in a high-risk patient population versus excluding significant pathology in a co-morbid patient?

Mistake 4 Switching off after reaching the caecum

Reaching the caecum is an obvious objective and a key performance indicator (KPI) for colonoscopy. Measuring caecal intubation rates has driven up quality and is associated with reduced rates of incomplete colonoscopy. [14] However, the key focus of the procedure starts at this point, as the main objective is a high-quality colonic withdrawal. It is worth noting that this may coincide with endoscopist fatigue and high cognitive load, particularly with a challenging insertion. A high-quality examination on withdrawal is intimately related to sound-quality bowel preparation, and the PCCRC data cautions endoscopists against tolerating sub-optimal bowel preparation. [10]

Adenoma detection rates are another critical KPI dependent on the extubation technique.[15,16] It is essential to use the vast array of adjuncts to optimise extubation. These include mucosal washing, adjuncts such as cuffs and caps, proactive patient position change, 360° rotational luminal examination, and attention to high-risk areas such as flexures with double extubation. In addition, the use of antimotility agents such as hyoscine to minimise colonic spasms and the use of imaging enhancements such as Narrow Band Imaging (NBI), Linked Colour Imaging (LCI) and Texture and Colour Enhancement Imaging (TXI) are valuable tools to enhance detection and characterisation of pathology on extubation [17]. There is also mounting evidence for Artificial Intelligence (AI) in lesion detection and recognition [18,19], and it may well be an essential adjunct in the next few years. There is growing literature on the accuracy of AI for both lesion detection and characterisation, which may counter issues such as endoscopist fatigue.

Extubation takes time and focus, hence the recommendation of a minimum 6-minute withdrawal time. [15] Additionally, other experienced team members are in the room alongside the endoscopist, so re-engaging the team during extubation with the clinical question can assist with detecting pathology.

Finally, it is important not to get distracted by technical aspects, i.e., chromo-endoscopy, which may result in the endoscopist 'looking but not seeing'. A high-quality colonoscopy (particularly the index case) centred on high-quality extubation is critical to identifying and resecting polyps, preventing colorectal cancer and reducing unnecessary subsequent colonoscopy.

Mistake 5 Mistakes in communicating pathological findings and complications

Given the development of advanced endoscopic procedures, our attention to and management of complications relates to patient outcomes. Communication failures are a key component

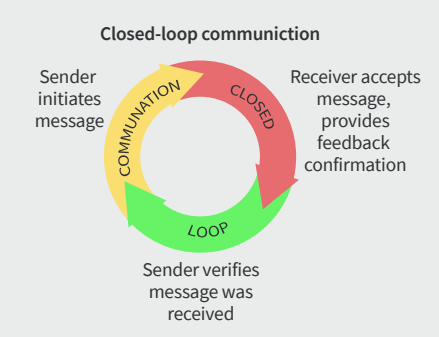

Figure 3 | Closed loop communication.

of medico-legal complaints, highlighting the importance of a robust consent process.

Communication with the patient and the endoscopy team, even in a 'routine' procedure, is a crucial endoscopic non-technical skill which can be trained and evaluated.[4,21] The focus for endoscopists in training is often on technical ability, but non-technical skills are often what expert endoscopists with experience put into practice. These include effective communication, teamwork, situational awareness, judgement, and decision-making. Clinical judgement is crucial and particularly relevant when deciding not to proceed if this is in the patient's best interest.

It is established that there is a high cognitive load when managing a safety incident or complication, which may negatively impact technical performance. This can result in tunnel vision and the unintended consequence of diminishing clear, verbal communication between the team during an emergency. It is essential to recognise the relevance of human factors in this situation and call for help early. The use of directed short cues, closed-loop communication (see figure 3), and developing a 'shared awareness' with open dialogue among team members is essential to effectively lead team members in such situations.[22,23]

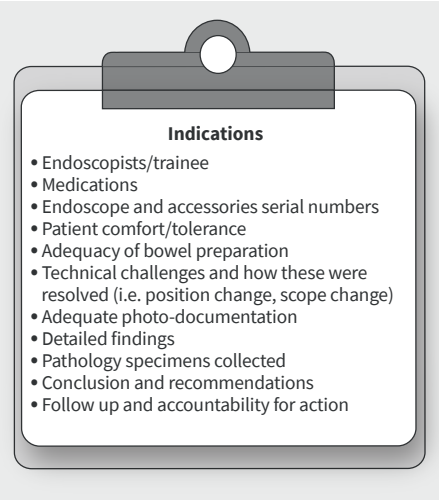

Figure 4 | Critical aspects of endoscopy reporting.

Alongside this, patient communication should be individualised, ensuring targeted and specific communication whilst prioritising patient safety.

Mistake 6 Failure to write a comprehensive endoscopy report that addresses the clinical question

Despite variations in endoscopy reporting software, most generally utilise mandatory automated fields with accompanying free text options. Report writing is an essential aspect of the procedure completed at the end of the case. Multiple potential distractors relate to transferring the patient from the procedure room and getting the next patient in. This is often compounded by the endoscopist tending to many tasks simultaneously (dual-task interference) and endoscopist fatigue after a demanding case. It is clear to see how errors can creep in. High-quality data entry into the endoscopy report enables us to accurately measure patient outcomes, supporting safety and quality measures.[24] Critical aspects of endoscopy reporting are summarised in the information box (figure 4).

Separately, the endoscopy report is a crucial medical document and a surrogate marker of the quality of the procedure. Established guidance exists on what constitutes an effective endoscopy report, and high-quality photo-documentation of important landmarks and pathology is essential.[15,25] This is particularly important when examining aspects of colonoscopy quality, such as PCCRC. It is important to identify if a lesion was 'missed' at colonoscopy or if accelerated cancer pathways might account for interval cancers.

The endoscopy report should accurately reflect the case, including patient tolerance, sedation strategy, colonoscope subtype and adjuncts, and any technical difficulties encountered and how they were overcome – all of which may inform any subsequent colonoscopy. The target audience should be considered, and communication should be adapted as the patient, the primary care doctor, and the referring clinician will receive the report.

The endoscopist should ensure that the endoscopy report addresses the clinical question for that patient and is not solely a technical report. To this end, a clinical diagnosis, histology results, management of anticoagulant agents, an indication of next steps and clarity around any subsequent surveillance procedures should be included where feasible.

Most importantly, the report should read as a stand-alone document where the clinical indications, relevant comorbidity, endoscopic diagnoses, and subsequent management is transparent such that should the patient present at another unit with a post-procedural complication, all the information is readily available from the endoscopy report. It should also be remembered that the report may have to be referred to in medico-legal cases. Care and attention should be given to ensure the report reflects the clinical episode, all the findings, and limitations.

In summary, colonoscopy is a complex procedure, and errors in endoscopy will occur. A focused consideration of technical and non-technical skills can reduce the incidence of avoidable mistakes and positively impact colonoscopy patient safety and quality.

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Your colonoscopy briefing

UEG Week

- 'Artificial intelligence – aided colonoscopy does not increase adenoma detection rate in routine clinical practice' session at UEG Week 2022 [https://ueg.eu/library/artificial-intelligence-aided-colonoscopy-does-not-increase-adenoma-detection-rate-in-routine-clinical-practice/252643]
- 'When and how do we do surveillance colonoscopy?' session at UEG Week 2022 [https://ueg.eu/library/when-and-how-do-we-do-surveillance-colonoscopy/252427]
- 'Role of AI in colonoscopy detection of advanced lesions' session at UEG Week 2022 [https://ueg.eu/library/role-of-artificial-intelligence-in-colonoscopy-detection-of-advanced-lesions/253021]
- 'Interruption of anti-thrombotic therapies and risk of post-colonoscopy thromboembolic events: a real-world cohort study' session at UEG Week 2022 [https://ueg.eu/library/interruption-of-anti-thrombotic-therapies-and-risk-of-post-colonoscopy-thromboembolic-events-a-real-world-cohort-study/252859]
- 'Systemic review and meta-analysis: the global three-year post-colonoscopy colorectal cancer rate as per the world endoscopy organization methodology' session at UEG Week 2022 [https://ueg.eu/library/systematic-review-and-meta-analysis-the-global-three-year-post-colonoscopy-colorectal-cancer-rate-as-per-the-world-endoscopy-organization-methodology/252521]

Standards and Guidelines

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