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Risk-Stratified Patient Pathways in Coloproctology: Selective Ambulatory Surgery, Digital Follow-Up and Multidisciplinary Escalation

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Abstract

Modern coloproctological care increasingly depends on the ability to place each patient in the least resource-intensive setting that remains clinically safe. The aim of this analytical review was to reformulate the integrated-care concept around risk stratification, selective ambulatory surgery, short-stay treatment, digital continuity and timely multidisciplinary escalation. Publications from 2021-2025, current clinical guidance and international screening documents were synthesized. Evidence indicates that selected low-risk proctological procedures can be performed in an outpatient setting without a measurable loss of effectiveness, provided that exclusion criteria, postoperative access and escalation rules are explicit. Telemedicine is most defensible as a follow-up tool after a physical examination, whereas complex oncological, inflammatory and reconstructive cases benefit from multidisciplinary decision-making. A practical risk-based pathway and a compact audit framework are proposed. The model shifts attention from institutional boundaries to clinical need, continuity and measurable outcomes, including patient-reported measures.

Keywords: Coloproctology, risk stratification, ambulatory surgery, short-stay care, digital follow-up, patient pathway, multidisciplinary team, PROMs.

Introduction

Coloproctology combines disorders with very different clinical urgency, technical complexity and resource requirements. A patient with uncomplicated hemorrhoidal disease or a simple anal fistula may require a focused diagnostic assessment and a minor procedure, whereas colorectal cancer, severe inflammatory bowel disease, complex fistulizing disease or reconstructive pelvic surgery may require high-intensity inpatient care and multidisciplinary planning. When all these patients are managed through the same hospital-centered route, the system tends to overuse beds for low-risk cases while still generating delays for those who truly need specialized resources.

The key organizational question is therefore not whether outpatient care is preferable to inpatient care in general, but how to identify the safest level of care for a particular clinical episode. The concept developed in the source article emphasized integration of outpatient, day-case, inpatient and digital components. In the present version, that framework is narrowed and reframed around risk stratification and escalation: every patient should enter a single pathway, receive an explicit risk category, and move to a more resource-intensive level only when predefined clinical criteria are met. This creates a clearer connection between clinical severity, use of resources and continuity after discharge.

Recent guidance on enhanced recovery after colorectal surgery has strengthened the idea that standardized pathways themselves are a quality intervention [7]. At the same time, telemedicine studies in proctology show that digital contact can improve continuity and perceived safety when it supports, rather than replaces, physical examination [1–4]. The experience of the COVID-19 period also demonstrated how vulnerable fragmented services become when in-person access is disrupted [12].

These observations support a model in which risk assessment, care setting and follow-up modality are planned as one continuous process.

Objective

To develop an institution-neutral model of risk-stratified coloproctological care that links initial triage, ambulatory treatment, short-stay admission, specialist inpatient care, multidisciplinary escalation and digital follow-up, and to define a concise set of indicators suitable for routine audit.

Methods

This work was designed as an analytical narrative review. The evidence base included publications from 2021–2025 on telemedicine in proctology and colorectal surgery, ambulatory anorectal interventions, enhanced recovery, multidisciplinary cancer care, patient-reported outcome measures and composite quality indicators. Current WHO Europe and IARC documents on organized colorectal cancer screening were also considered [13, 14]. Preference was given to clinical studies, systematic reviews, meta-analyses, consensus statements and professional guidance. No original patient-level dataset was analyzed; numerical values are reported only when they are available in the cited publications.

The synthesis was organized around five decision points: (1) initial risk and red-flag identification; (2) selection of the lowest safe treatment setting; (3) criteria for escalation to short-stay or full inpatient care; (4) digital continuity after discharge; and (5) measurement of clinical and patient-centered outcomes. This decision-oriented structure slightly differs from a conventional literature review because the objective is to translate heterogeneous evidence into an operational pathway.

Results and Discussion

Risk stratification becomes the organizing core of the model. At first contact, the task is not to establish every final diagnosis, but to distinguish uncomplicated, stable presentations from conditions with oncological suspicion, sepsis, major bleeding, severe pain with systemic manifestations, significant comorbidity or uncertain anatomy. Low-risk patients can proceed to specialist outpatient assessment; intermediate-risk cases may require day-case or short-stay observation; high-risk and clinically unstable patients should move directly to a specialist inpatient pathway. Complex oncological, inflammatory or reconstructive cases represent a separate escalation class because the main need is coordinated decision-making rather than merely a longer hospital stay.

The benefit of this structure is that it separates clinical risk from institutional habit. A hospital bed is used when monitoring, anesthesia, complexity or instability requires it, not simply because a procedure has traditionally been performed in an operating department. Conversely, outpatient care is not treated as a cost-saving default: patients with high bleeding risk, severe comorbidity, inability to secure postoperative support or difficult fistula anatomy should not be forced into an ambulatory format [6].

Operational red flags and escalation logic

A risk category becomes clinically useful only when it is linked to observable escalation criteria. Red flags should include suspected malignancy, systemic infection or sepsis, uncontrolled hemorrhage, rapidly progressive pain, significant immunosuppression, major anticoagulant-related bleeding risk, acute bowel obstruction, severe dehydration and an inability to ensure safe follow-up. These features do not all imply immediate major surgery, but they should prevent routine discharge into a low-intensity pathway until the cause has been clarified. In addition, social and logistical factors matter: a patient living far from emergency care, without a responsible adult after anesthesia or without reliable communication may require a higher level of observation despite a technically minor procedure.

Escalation should be bidirectional rather than permanent. A patient may move upward from outpatient care to short stay because of unexpected pain or bleeding, and later move downward to digital follow-up once stable. Conversely, a high-risk patient whose acute problem has been controlled should not remain in a specialist bed solely because of the original admission category. This dynamic approach prevents both premature discharge and unnecessary prolonged hospitalization. It also makes the pathway auditable because each transfer has a stated reason rather than being based on informal preference.

For routine use, the most practical decision rule combines clinical severity, procedural complexity, anesthesia requirement and follow-up reliability. None of these dimensions should be interpreted in isolation. A technically simple procedure in a medically fragile patient may require a monitored setting, while a more invasive but standardized procedure in a well-selected patient may be suitable for short stay. The purpose of stratification is therefore not to label diseases as 'outpatient' or 'inpatient', but to match the whole clinical episode to the safest efficient setting.

Selective ambulatory surgery and short-stay care

Evidence from simple anal fistula surgery illustrates this principle. Demir et al. analyzed 339 patients, including 279 treated in an outpatient setting and 60 in an operating-room setting. Recurrence-free success was 93.2% and 88.3%, respectively, and the difference was not statistically significant ($p=0.154$); the ambulatory pathway was also associated with lower costs [5]. These findings do not justify outpatient treatment for complex fistulas, but they show that carefully selected low-risk cases do not automatically require the most resource-intensive environment.

The practical implication is the need for an intermediate layer between the clinic and prolonged hospitalization. Day hospital and short-stay care can accommodate minimally invasive procedures, brief postoperative monitoring, pain control and early discharge, while preserving the option of escalation if instability develops. This tier is particularly important for patients who are

technically suitable for limited surgery but require observation because of anesthesia, social circumstances or borderline clinical risk.

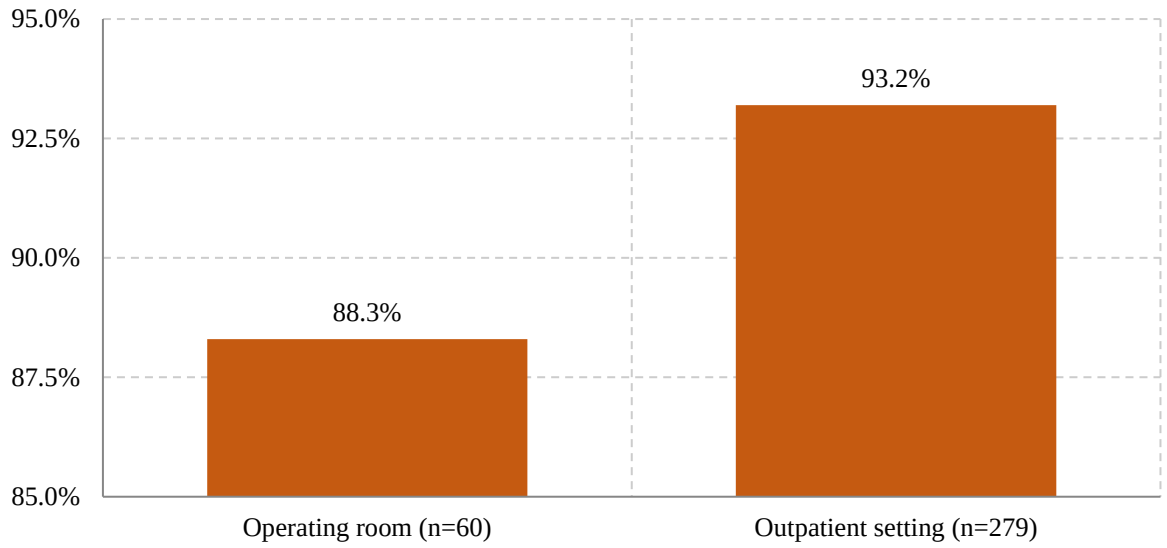


Figure 1 – Recurrence-free success in simple anal fistula treatment by intervention setting [5].

Table 1 – Risk-based routing matrix for coloproctological care

Risk category	Typical profile	Preferred setting	Escalation trigger	Primary audit metric
Low	Stable benign disease; minor procedure expected	Specialist outpatient care	Diagnostic uncertainty, uncontrolled pain, bleeding or failed conservative care	Completion without unplanned admission
Intermediate	Procedure needing anesthesia or short observation	Day hospital / short stay	Instability, unexpected complexity, difficult pain control	Unplanned transfer or readmission
High	Sepsis, major bleeding, severe comorbidity, complex anatomy	Specialist inpatient care	Need for intensive monitoring or major surgery	Major complications and length of stay
Complex / oncologic	Cancer suspicion, IBD complexity, reconstruction, pelvic floor disorder	MDT-linked specialist pathway	Change in stage, anatomy or treatment intent	Time to MDT decision and pathway completion

Digital continuity after examination

Digital follow-up should be positioned after an adequate clinical assessment. Anorectal disease frequently requires inspection, digital rectal examination, anoscopy or endoscopy, and a remote first contact can miss clinically significant pathology. In the Italian e-consensus on telemedicine, 74% of participating experts agreed that remote consultation carries a risk of missing cancer, supporting the principle that a decision for surgery should not be based solely on teleconsultation [1]. A related colorectal surgery consensus also supported telemonitoring and selected postoperative contacts while rejecting telemedicine as a universal substitute for initial in-person assessment [2].

The strongest practical evidence concerns follow-up. Gaj et al. reported that a digital postoperative diary in 98 proctological patients improved the perceived quality and safety of follow-up; messenger use was independently associated with a more favorable perception of outcome (OR 4.06; 95% CI 1.35–12.24) [3]. In a randomized trial of 46 patients after major colorectal surgery, Yao et al. found that a postoperative telemedicine visit was not inferior to an in-person visit for satisfaction and did not worsen patient-reported safety [4]. Thus, digital tools are best understood as continuity infrastructure: reminders,

symptom reporting, wound-related questions, result review and rapid triggering of an in-person visit when predefined warning signs appear.

A useful digital pathway should therefore record a unified care plan, transmit test results between levels, schedule the next contact automatically and generate escalation alerts. Digitizing fragmented practice without changing decision rules merely reproduces paper bureaucracy electronically. The central digital object should be the patient pathway with time limits and escalation criteria, not simply an electronic record.

Multidisciplinary escalation and standardization

Risk stratification also identifies patients for multidisciplinary escalation. Colorectal cancer, complicated inflammatory bowel disease, complex pelvic floor disorders and reconstructive cases often require coordinated input from colorectal surgeons, gastroenterologists, oncologists, radiologists, pathologists and rehabilitation specialists. A meta-analysis by Peng et al. including 11 studies and 30,814 colorectal cancer patients found an association between multidisciplinary team management and improved overall survival (HR 0.81; 95% CI 0.69–0.94) [11]. Although much of the underlying evidence is observational, the direction of effect supports structured team decision-making for complex disease.

Escalation is only useful when the receiving level follows standardized protocols. The national LAPCO training program in England demonstrated that structured competency-based education can influence surgical outcomes as well as adoption of laparoscopy [8]. ASCRS/SAGES enhanced recovery guidance similarly emphasizes a standardized perioperative pathway encompassing patient preparation, multimodal analgesia, nutrition, mobilization and discharge criteria [7]. For an organizational model this means that routing and protocolization must operate together: moving a patient to the correct location without a defined process does not guarantee quality.

Patient-centered outcomes and audit

Traditional surgical audit focuses on mortality, complications, reoperation and length of stay. These measures remain essential but are insufficient in coloproctology, where technically successful treatment may still leave pain, bowel dysfunction, incontinence, impaired social functioning or dissatisfaction. Patient-reported outcome measures (PROMs) complement clinical endpoints by documenting outcomes that matter directly to the patient, including quality of life, stool frequency, pain and functional limitations [9, 15].

A second useful concept is the composite 'textbook outcome'. The systematic review and meta-analysis by Mac Curtain et al. included 15 studies and more than 300,000 patients; the average proportion achieving textbook outcome was approximately 55%, but definitions varied substantially [10]. The lesson for service audit is not to copy a single composite number uncritically, but to define a transparent local composite: no severe complication, no unplanned reoperation, no early readmission, completion of the planned pathway, documented follow-up and an acceptable patient-reported result.

Organized colorectal cancer screening should also connect to the same pathway. Screening has limited organizational value if a positive test is not linked to timely endoscopy, diagnosis and treatment. WHO Europe emphasizes organized programs with quality assurance and completion of the diagnostic pathway [13], while the fifth edition of the European Code Against Cancer maintains organized screening as a central prevention strategy [14]. In a risk-stratified model, screening is therefore not a parallel public-health activity but an entry channel into the same managed pathway.

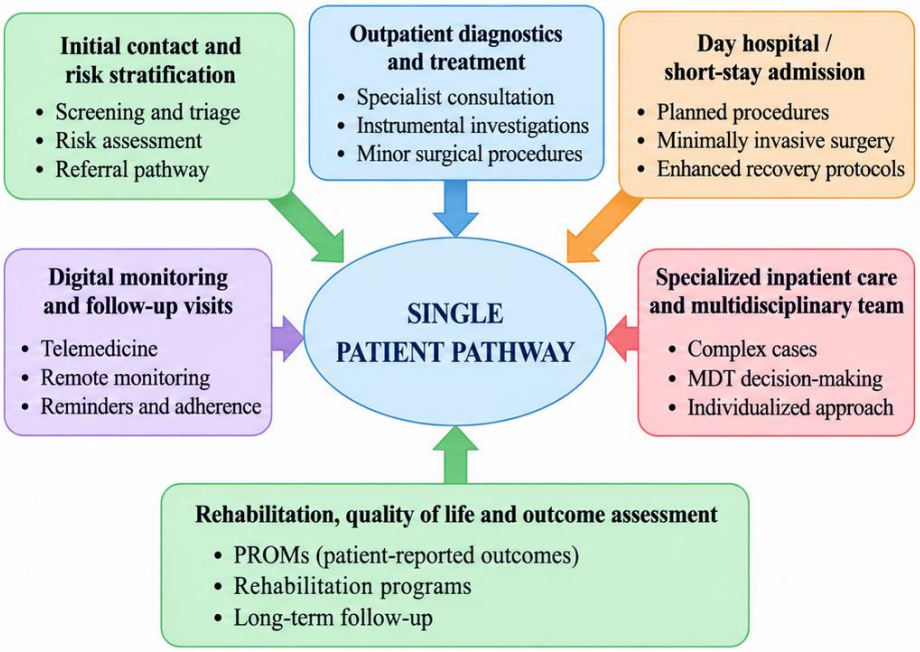


Figure 2 – Risk-stratified integrated patient pathway in coloproctology (adapted from the source framework and synthesized from [1–11]).

Table 2 – Compact indicator set for practical audit of the pathway

Domain	Core indicators	Interpretation
Clinical safety	Clavien–Dindo III–V complications; unplanned reoperation; emergency visit; recurrence	Detects harm and failed selection
Flow and access	Referral-to-specialist time; decision-to-procedure time; pathway deviations	Measures timeliness and coordination
Resource use	Share completed without overnight admission; short-stay conversion; readmission	Tests whether resources match risk
Patient-reported	PROM score; communication satisfaction; loss to follow-up	Captures function, quality of life and continuity
Economic	Cost per completed episode including complications and repeat contacts	Avoids misleading bed-day-only comparisons

Implementation framework

Implementation should proceed in stages. First, the existing patient journey is mapped to identify delays, duplicated investigations and avoidable admissions. Second, explicit referral and escalation criteria are agreed. Third, selected low-risk procedures are transferred to outpatient or short-stay care while maintaining rapid access to inpatient escalation. Fourth, a digital postoperative channel is introduced with clear red-flag triggers. Fifth, the service begins routine measurement of a small set of clinical, organizational and patient-reported indicators. Only after the workflow has stabilized should a larger digital platform be expanded.

This sequence is intentionally conservative. It reduces the risk of investing in technology before the clinical process has been redesigned and protects against another common error: treating ambulatory care as an administrative target rather than a clinically selected pathway. The model can be adapted to different financing systems and levels of infrastructure because its core elements are decision rules rather than a specific institutional architecture.

Limitations

The proposed framework is conceptual and is based on synthesis of studies with heterogeneous designs. Several data sources address specific procedures or disease groups and cannot be generalized automatically to all coloproctology. Ambulatory surgery studies usually involve carefully selected patients, while telemedicine evidence mainly concerns postoperative and repeat visits. Local staffing, financing, transport, digital infrastructure and patient preferences may substantially modify the optimal configuration. The model should therefore be tested prospectively and adapted to local capacity rather than implemented as a fixed template.

Conclusion

A risk-stratified patient pathway provides a practical way to reorganize coloproctological care without reducing the model to a simple outpatient-versus-inpatient choice. Low-risk patients can be managed selectively in ambulatory or short-stay settings; high-risk and unstable patients require specialist inpatient resources; complex oncological, inflammatory and reconstructive cases should trigger multidisciplinary escalation. Digital follow-up adds the greatest value after adequate physical assessment, where it supports continuity, adherence and rapid recognition of warning signs [1–4].

The sustainability of the model depends on three linked mechanisms: explicit risk-based routing, standardized clinical protocols and measurement of outcomes that include both safety and the patient's perspective. Such a framework can improve access and resource efficiency while preserving clinical caution, and it provides a reproducible basis for local audit and future prospective evaluation.

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