

Estimated benefits and willingness of remote monitoring in IBD patients in remission under maintenance therapy: results of a questionnaire in a tertiary referral centre

S. Brams^{1,*}, D. Beeckmans^{1,*}, S. Delen^{1,2,3}, L. Fierens², M. Vanhaverbeke², J. Sabino^{1,2}, B. Verstockt^{1,2}, S. Vermeire^{1,2}, M. Ferrante^{1,2}

(1) Department of Gastroenterology and Hepatology, University Hospitals Leuven, Leuven, Belgium; (2) Department of Chronic Diseases and Metabolism, KU Leuven, Leuven, Belgium; (3) Department of Gastroenterology and Hepatology, ZOL Maas en Kempen, Maaseik, Belgium.

*Shared first co-authorship, equal contribution.

Abstract

Background: STRIDE II guidelines highlight the importance of closely monitoring patients with inflammatory bowel disease (IBD) to assess therapy effectiveness and predict or manage flares. However, with a growing patient population, the outpatient clinic capacity is strained, and many patients, especially those in long-term remission, may not require frequent in-person visits. This study aims to assess the interest for optimizing resources through remote monitoring for patients with IBD in a high-volume referral centre.

Methods: An anonymous survey was conducted in 281 adult IBD patients, either untreated or on stable subcutaneous or oral maintenance therapy for more than one year. We assessed interest in a remote monitoring program and insights into their preferences for its implementation as well as eventual cost and time savings.

Results: Of the 281 patients (52% female, 67% Crohn's disease, 32% ulcerative colitis, 1% IBD type unclassified), 76% expressed interest in reducing their outpatient visits in favour of remote monitoring. Of note, 79% of these 214 patients were willing to attend outpatient clinic visits every two years. However, patients emphasized the importance of personal contact in establishing a trustworthy and safe remote monitoring system. Additionally, the study identified cost and time savings for patients, as a visit to the outpatient visit took a median (interquartile range) of 3 (2-4) hours.

Conclusion: Remote monitoring is a promising program for IBD patients in stable remission, offering potential financial and time savings for employers, patients, and society. However, further research is required to evaluate the safety and feasibility of this approach. (*Acta gastroenterol belg.*, 2026, 89, 43-53).

Keywords: Inflammatory bowel diseases, remote monitoring, patient's preferences, remission, outpatient clinic

Abbreviations:

CD: Crohn's disease
 CI: confidence interval
 IBD: Inflammatory bowel disease
 IBDU: Inflammatory bowel disease type unclassified
 GP: general practitioner
 IQR: interquartile range
 PRO: patient reported outcome
 UC: ulcerative colitis

Introduction

Inflammatory bowel disease (IBD) encompasses a range of chronic inflammatory disorders affecting the digestive system, including Crohn's disease (CD), ulcerative colitis (UC), and IBD type unclassified (IBDU). These conditions are characterized by unpredictable episodes of symptoms, such as abdominal pain, (bloody) diarrhoea, weight loss, and fatigue. IBD

typically manifests in adolescents and young adults, a group that is often leading active professional and social lives. The course of IBD is marked by alternating periods of flares and remission, necessitating ongoing monitoring and longitudinal follow-up to manage symptoms and adjust therapies.

A systematic review published in 2021 estimates that 1.3 million people in Europe suffer from IBD, which represents approximately 0.2% of the European population (1). New data indicate that both the incidence and prevalence of IBD continue to rise globally, alongside significant advancements in medical therapy and disease management. As the number of IBD patients continues to rise, there is increasing pressure on healthcare systems, as patients require frequent outpatient visits for monitoring, especially those receiving advanced therapies such as biologics or small molecules.

Currently, the standard approach for IBD follow-up in Belgium involves annual visits for patients in remission on conventional therapy and biannual visits for those on advanced treatments (2,3). However, the current model is straining the outpatient clinic capacity, increasing time pressure on health care professionals and compromising daily operations. In particular, patients in long-term remission on stable medication often express a preference for less frequent visits, suggesting that many routine follow-up appointments may not be necessary. Experts in the field have observed that patients in remission do not typically require additional interventions during these visits, and they advocate for a more tailored approach to follow-up care, focusing on the early detection of disease flares through non-invasive tests (2,3).

As the healthcare system faces increasing demands, optimizing the follow-up care for stable IBD patients through alternative approaches, such as remote

Correspondence to: Marc Ferrante MD PhD, Department of Gastroenterology and Hepatology, University Hospitals Leuven, Herestraat 49, B3000 Leuven, Belgium. Tel: +32 16 34 42 25.

Email: marc.ferrante@uzleuven.be
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monitoring, could provide a more efficient and patient-centric solution. Remote monitoring would enable continuous and personalized disease management while reducing unnecessary clinic visits, alleviating the burden on both patients and healthcare providers, and providing more timely access to care for those in need. This approach could represent a strategic shift in managing IBD care, optimizing resources, and improving the overall patient experience without compromising quality of care.

Materials and methods

An anonymous online or paper questionnaire (Supplementary Table 1) was distributed to IBD patients in stable remission to gauge their interest in remote monitoring and gather valuable insights into how such a program should be structured to best meet their needs. Furthermore, this questionnaire aimed to evaluate the potential time and cost savings associated with the implementation of remote monitoring.

At the outpatient clinic of the University Hospitals Leuven (Leuven, Belgium), three-hundred patients in stable remission initiated the anonymous questionnaire of the ATTENDANT trial, after approval by the Ethical Committee Research UZ/KU Leuven (S68471; B3222023001327). The study period spanned from 2 January 2024 to 9 May 2024, with the first and last questionnaires completed on these respective dates.

Patient population

The questionnaire was fully self-administered and completed anonymously by patients during their IBD outpatient visit. Patients accessed the online survey via a QR code and completed it independently on their own device, without investigator assistance. Nine patients had difficulties with scanning the QR code and were therefore offered a paper version. Results of these paper surveys were only assessed at the end of the recruitment period, so they could not be linked to a specific patient.

The digital survey incorporated branching logic to automatically guide participants through relevant sections based on previous answers, thereby minimizing confusion and input errors. Due to the anonymous design, investigators could not verify responses in real time; nineteen incomplete questionnaires were therefore excluded from the final analysis. More specifically, these participants did not answer the key question: “Would you be interested in attending the outpatient clinic less frequently if you could be monitored remotely by the IBD team?”

On the first pages of the survey, patients were asked to indicate whether they had Crohn’s disease, ulcerative colitis, or IBD type unclassified, as well as their current therapy and its treatment duration. These self-reported answers automatically determined whether the patient

fulfilled the predefined inclusion and exclusion criteria.

Adult patients with CD, UC, or IBDU were included if they were in stable remission. Patients were considered to be in stable remission if they had been on the same treatment regimen — with oral mesalamine, thiopurines, methotrexate, subcutaneous biologics, and/or oral small molecules, or under no IBD-related therapy at all — for at least one year prior to completing the questionnaire, without any therapy changes during that period. Patients were excluded if they received intravenous biological therapy or an investigational drug for their IBD. If the provided answers indicated that a patient did not meet the inclusion criteria (e.g., treatment duration less than one year), the survey automatically redirected them to a final page thanking them for their participation and informing them that they were not eligible for the study. Only participants meeting all criteria proceeded to the full questionnaire.

Data collection

REDCap (version 14.5.34 - © 2025 Vanderbilt University) was used for the set-up of the anonymous questionnaire, which contained maximally thirty-one questions. Due to the implementation of branching logic, the number of questions varied depending on selected answers. Baseline patient characteristics included demographics, disease type, disease duration, occupation, and current medical therapy. Additional data were collected on healthcare utilization (time and costs linked to outpatient clinic visits), the impact of clinic visits on work or school, habits related to stool sample submission, and patient perspectives on remote monitoring, including overall interest (Yes/No) and specific aspects of the concept (Yes/No questions for each element) (Supplementary Table 1). The patient could also give some additional comments on the role of, as well as their interest in and eventual concerns about remote monitoring.

Data analyses

Statistical analyses were performed with IBM® SPSS® Statistics (version 29.0.1. – ©2025 Yew York, USA).

Descriptive analyses were executed on all data, using median (interquartile range, IQR) or percentages where appropriate. Additionally, a Chi-Squared test was conducted to assess potential relationships between type of therapy (none, conventional, or advanced therapy), and preferences for a remote monitoring program.

Finally, a Pearson correlation analysis was performed to evaluate whether age, disease duration, distance from the hospital, time spent on an outpatient clinic visit and costs of transfer towards the outpatient visit were correlated with the willingness to participate in remote monitoring.

Results

Demographics

Thirty-seven patients reported receiving intravenous biologic therapy for their IBD or having been on their current IBD treatment for less than one year. As a result, they did not fulfil the eligibility criteria and were excluded from the study.

Of the three hundred patients who met the inclusion criteria, 281 (52% female, 68% CD, 31% UC, and 1% IBDU) were maintained for the statistical analyses. The other 19 patients did not fill out the most important elements of the questionnaire and were excluded for further analyses. Patients above 60 years old were less represented in this study, but more than two third of the patients had a disease history of more than ten years. More detailed patient demographics are shown in Table 1.

Patient's interest in a remote monitoring program

Out of the 281 participating patients, 214 (76%)

indicated that they would be interested in visiting the outpatient clinic significantly less often if they could be monitored remotely by the IBD-team. A correlation analysis suggested that younger patients might be more interested in remote monitoring compared to older patients ($r = -0.21$; $P = 0.0005$, $n = 281$). No significant correlation was observed between interest in remote monitoring and i) disease duration ($r = -0.09$; $P = 0.13$, $n = 281$); ii) travel distance ($r = 0.01$; $P = 0.84$, $n = 278$); iii) total time spent on an outpatient clinic visit ($r = 0.07$; $P = 0.21$, $n = 281$); iv) time spent in the hospital ($r = 0.02$; $P = 0.77$, $n = 281$); v) travel cost with public transport ($r = 0.24$; $P = 0.14$, $n = 40$) and vi) total travel cost ($r = 0.06$; $P = 0.33$, $n = 281$).

The 67 patients (24% of the 281 patients) who were not interested in a remote monitoring program were further questioned on their reasoning. Sixty-six patients provided an answer on this open question (Supplementary Table 2). Thirty patients or 45% of them indicated a strong preference for face-to-face consultations, valuing direct communication with healthcare providers. About 9% mentioned struggling

Table 1. — Overview of patient demographics (n = 281).

Demographic features	Number of patients (%)
Gender	
Male	134/281 (48%)
Female	147/281 (52%)
Age	
18 – 39 years old	97/281 (35%)
40 – 60 years old	122/281 (43%)
> 60 years old	62/281 (22%)
IBD diagnosis	
Crohn's disease	189/281 (67%)
Ulcerative colitis	90/281 (32%)
IBD type unclassified	2/281 (1%)
Disease duration	
< 5 years	34/281 (12%)
5 – 9 years	44/281 (16%)
10 – 20 years	91/281 (32%)
> 20 years	112/281 (40%)
Current IBD-related therapy	
No IBD-related therapy	43/281 (15%)
Conventional therapy only	31/281 (11%)
Subcutaneous or oral advanced therapy	207/281 (74%)
Employment	
Actively employed	198/281 (71%)
- Fulltime	134/192* (70%)
Students	5/281 (2%)
Looking for a job	4/281 (1%)
Disabled	17/281 (6%)
Sick leave	7/281 (3%)
Retired	46/281 (16%)
Unemployed	4/281 (1%)
*Six patients selected the option "other" and replied then in the open field that they had a job. The follow-up question on the percentage of employment did not open, when "other" was selected, this only became available if the patient indicated that he or she was actively working or self-employed.	

with technology, while another 15% regarded remote monitoring unsuitable as it would not include a physical examination and blood testing. Twenty percent indicated that they had no problem with their current follow-up scheme. Finally, eleven percent would miss emotional reassurance in in-person consultations.

Patient's preferences

The 214 patients who expressed interest in a remote monitoring program were subsequently surveyed to identify the aspects of the program they would be willing to undertake. All prespecified suggestions appeared acceptable to most patients, specifically completing patient-reported outcomes (maximum of 10 minutes) electronically every three months; performing a home-based stool analysis every three months; bringing a stool sample to their general practitioner or a nearby hospital every three months; visiting their general practitioner or a nearby hospital annually for a blood test; attending the outpatient clinic every two years and attending the outpatient clinic every year. Exact values are displayed in Figure 1 below.

A Chi-Squared test was performed to investigate the relationship between patient therapy group (conventional therapy only, advanced therapy, and no IBD therapy) and their willingness to participate in follow-up and monitoring activities. A significant association was observed between therapy group and the willingness to attend the outpatient clinic annually ($P = 0.002$) as well as every two years ($P = 0.02$), indicating that willingness to attend scheduled outpatient visits varies by treatment type. Specifically, patients in the advanced therapy group showed greater willingness to visit the outpatient clinic annually compared to those in the conventional therapy group ($P = 0.004$). However, no significant difference in willingness to attend annual visits was found between the conventional therapy and no IBD therapy groups (P

$= 0.52$) or between the advanced therapy and no IBD therapy groups ($P = 0.08$).

In contrast, patients in the conventional therapy group were more willing to visit the outpatient clinic every two years compared to those in the advanced therapy group ($P < 0.001$). A significant difference was also observed between the conventional therapy group and the no IBD therapy group regarding willingness to attend visits every two years ($P = 0.023$). No significant difference in willingness to visit the outpatient clinic every two years was found between the advanced therapy and no IBD therapy groups ($P = 0.36$).

No statistically significant association was found for willingness to perform a home-based faecal calprotectin test every three months ($P = 0.32$), deliver a stool sample to a local hospital or GP every three months ($P = 0.51$), undergo yearly blood tests locally ($P = 0.33$), or complete electronic patient-reported outcomes quarterly ($P = 0.90$). These findings indicate that patients' willingness to attend outpatient clinic visits yearly or every two years is associated with their treatment type, whereas other monitoring strategies do not show significant variation across therapy groups. No correction for multiple testing was applied, as this is an exploratory study. Descriptive statistics are displayed in table 2.

After entering data into a remote monitoring platform, the majority of patients (75%) prefer to be contacted via the platform only in case of deviating results, while 22% would like to receive a response every time. Three percent indicated that they do not need to be contacted. This question was answered by a total of 214 patients.

Patients' compliance

Patients were also asked about their current compliance with analysis of faecal calprotectin and the use of a remote application for patient reported outcomes (Mynexuzhealth at UZ Leuven). In the total

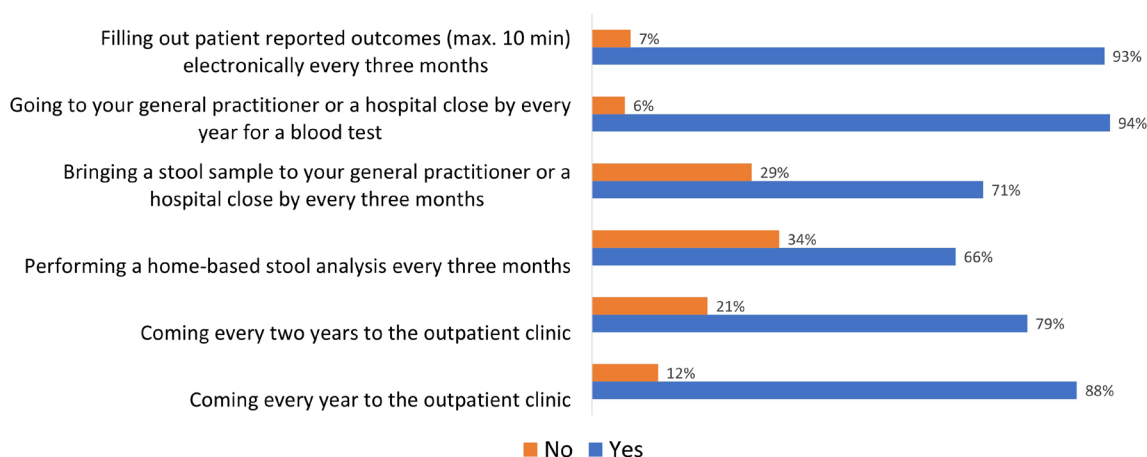


Figure 1. — Patients preferences for a remote monitoring program:

Notes: 1. All 214 patients who responded "Yes" to the question on reduced clinic visits completed these preference questions, with no missing data. 2. All 11 patients receiving Thiopurines or Methotrexate treatment were willing to go to their general practitioner or a hospital close by every three months for additional blood test.

Table 2. — Preferences for remote monitoring per therapy group.

	Therapy		
	Conventional therapy only (N = 23)	Advanced therapy (N = 160)	No IBD-therapy (N = 31)
Coming every year to the outpatient clinic	70%	93%	81%
Coming every two years to the outpatient clinic	100%	75%	84%
Performing a home-based stool analysis for faecal calprotectin every three months	50%	68%	66%
Bringing a stool sample to your general practitioner or a hospital close by every three months	64%	73%	66%
Going to your general practitioner or a hospital close by every year for a blood test	100%	94%	91%
Filling out patient reported outcomes (max. 10 min) electronically every three months	95%	93%	94%

Note: N represents the number of patients in a specific therapy group who completed the questions regarding preferences for remote monitoring. Percentages indicate the proportion of patients in a specific therapy group who would agree with a particular remote monitoring procedure.

study population (N = 281), 38% reported adequately bringing a faecal sample to the hospital every six months, 20% admitted that they often forget to do so, and 5% indicated that they do not currently bring in samples but would be willing to do so. The remaining 37% of patients responded that they do not bring a stool sample despite being requested. Among the 214 patients who indicated that they would be interested in remote monitoring, 37% reported bringing a stool sample every six months, 21% stated that they often forget, 5% indicated that they do not currently bring samples but would be willing to do so and 37% reported not doing so.

Regarding the application for patient reported outcomes, 93% reported that they currently use it, while 1% has not yet installed the application but was willing to do so. The remaining 6% indicated that they do not want to use the application (N = 281).

Finally, patients rate their compliance to the current treatment as rather high (median (IQR) score: 9 (8-10); on a maximum scale of 10; N = 278) and expect that remote monitoring would not influence their level of compliance (median (IQR) score: 5 (5-5); with a score of 5 indicating no effect and a score of 10 indicating maximal effect; N = 278).

Cost and time investments for patients in standard care

Patients reported a median (IQR) time of 90 (60-120) minutes spent in the hospital for an IBD outpatient clinic visit (N = 276). When considering the total time spent on an outpatient visit (including travel time,

waiting time, and contact time with the IBD team), the median (IQR) reported time was 180 (120-240) minutes (N = 277).

Of the 281 patients and allowing multiple options, 88% came to the outpatient clinic by car, 15% used public transport, 5% came by bicycle, 1% walked, and 2% used a motorcycle. The median (IQR) travel distance was 40 (18-60) kilometres (N = 278). For the 42 patients using public transport, this resulted in a median (IQR) cost of 12 (5-22.5) euros.

Additionally, 14% of the 281 patients had to come to the hospital for other indications aside from their IBD.

Discussion

The ATTENDANT study highlights the significant potential of remote monitoring for patients with IBD in stable remission. Our findings suggest that 76% of patients would prefer to reduce their in-person clinic visits by utilizing remote monitoring, echoing previous studies that emphasize the demand for alternative care models for IBD patients in stable remission (4,5). The high level of interest from patients, coupled with the potential time and cost savings for patients demonstrated in our survey, further supports the viability of integrating remote monitoring into the Belgian healthcare system.

When setting up a remote monitoring program in the future, it is crucial to consider patients' concerns about such a program. Among the patients who were not interested in remote monitoring, 45% expressed concerns that the remote contact would feel impersonal,

while 11% noted that the personal contact they receive during in-person visits provides essential emotional and psychological comfort. Additionally, some patients were concerned about the technical aspects of remote monitoring (such as a lack of computer skills) and the practicalities (e.g., how blood tests or physical exams would be conducted). These observations align with previously reported findings in a meta-analysis of 52 studies, which highlighted that patients' main concerns are access to information, healthcare, and shared decision-making (5). Results from our ATTENDANT study, as well as this meta-analysis, underscore the importance of maintaining a personal aspect of care in any future remote monitoring program. One potential solution would be to recognise IBD nurses as integral members of the care team. These nurses could act as the first point of contact for remotely monitored patients, discussing results from remote monitoring systems directly with them and providing the personal support they may need. Unfortunately, Belgian hospital financing does currently not include the costs of an IBD nurse. To tackle challenges with the technical aspects of remote monitoring and additional practicalities, a dedicated helpdesk has already been set up at UZ Leuven to assist patients to install the Mynexuzhealth application and help with further technical problems encountered when using the hospital app for remote monitoring programs. Patients who prefer to not install the mobile app can alternatively complete the questionnaires through a website portal via email invitation. Notwithstanding, patients would benefit from a dedicated contact person in the care team for any questionnaire-specific related questions when rolling out a remote monitoring program.

In addition, the potential of remote monitoring for IBD patients has been demonstrated in several studies. In the Netherlands, myIBDcoach has already been widely used and tested (4,6). Results showed (not surprisingly) successfully reduced outpatient visits while maintaining patient satisfaction. A pilot project conducted at UZ Leuven, using the Mynexuzhealth app, showed that it allowed accurate remote monitoring of disease activity, with alerts triggered during disease flares, enabling timely interventions. This study demonstrated the potential for detecting disease activity remotely, providing the foundation for further exploration of remote monitoring in IBD care (7). A recent meta-analysis of 19 RCTs with a total of 3,489 randomised participants, assessed the effectiveness of various remote monitoring interventions for IBD and found that web-based monitoring is likely equivalent to usual care in terms of disease activity and flares in adults, with moderate certainty (8). Additionally, in a separate systematic review and meta-analysis including 17 randomized controlled trials with 2,571 participants, it was reported that remote monitoring significantly reduced the number of in-person clinic visits (standard mean difference -0.71 , 95% confidence interval (CI) -1.07 to -0.36 ; $P < 0.001$) (9). Moreover, their subgroup analysis showed that adolescents in the

remote monitoring group had significantly better IBD-specific quality of life than those in the standard care group (standard mean difference = 0.42 , 95% CI 0.15 to 0.69 ; $P = 0.002$). Findings of the ATTENDANT study indeed suggest that younger patients tend to show more interest in remote monitoring ($r = -0.21$; $P = 0.0005$). These findings further underscore the promise of remote monitoring in enhancing patient care and optimizing healthcare resource utilization.

However, implementing remote monitoring programs in Belgium presents challenges, particularly due its specific healthcare infrastructure and financial remuneration structure. While in the Netherlands healthcare providers are reimbursed per IBD patient they monitor, whether through in-person or remote care (system of care trajectory payment), Belgium's more rigid reimbursement model, which only compensates for in-person visits, necessitates careful consideration when adapting remote monitoring solutions. Transition in the Belgian reimbursement model for IBD care from fee-for-service payment to fee-for-performance in a system of care trajectory payment may provide a solution here. Tailoring remote monitoring programs to specific patient subgroups, such as those in stable remission, may be essential to achieve the best outcomes, as not all patients may benefit equally from such systems (6).

The limitations of the ATTENDANT study include the fact that it was conducted at only one large referral centre, which may restrict the generalisability of the findings. Additionally, there was no identification of the ideal patient population for remote monitoring. Furthermore, the participation rate is unknown, leading to a potential bias as patients who filled out the questionnaire might be more interested in remote monitoring than others. Also, due to the fully anonymous design of the study, detailed clinical information such as Crohn's disease phenotype, history of IBD-related surgeries, or number of prior biologic exposures could not be collected. Consequently, it was not possible to assess whether patients with a more complex disease history might be less willing to participate in a remote monitoring program compared with those without such complications. This limitation should be considered when interpreting the results, as disease complexity may influence patients' willingness to reduce the frequency of in-person visits.

Another limitation concerns the definition of "stable remission" used in this study. Remission status was determined pragmatically based on patients' self-reported treatment history, as objective disease activity scores typically used in clinical research — such as the Crohn's disease Activity Index (CDAI) or the total Mayo score for ulcerative colitis — were not available. As a result, some patients classified as being in stable remission may not have met the criteria for true clinical remission. Future studies should incorporate objective disease activity measures to enable a more accurate assessment of remission status.

Furthermore, previous remote monitoring studies in

IBD predominantly enrolled younger patients with mild-to-moderate disease activity and limited comorbidity, leaving uncertainty about the suitability of remote monitoring for patients with more complex disease profiles (10). Future remote monitoring trials should therefore specifically investigate this population to better define potential barriers to participation. Furthermore, patients were not informed in the questionnaire that they would have to cover the costs of faecal calprotectin monitoring themselves. Awareness of these costs might have influenced their preferences for remote monitoring, and this should be considered when interpreting the results. However, faecal calprotectin analyses are already established for many years in our daily clinical practice, and therefore the costs associated with should have been known by the majority of (if not all) the patients. Additionally, while we assessed the total duration of hospital visits, we did not differentiate between the actual consultation time spent with the IBD team and the time patients spent waiting before being seen. This distinction could be relevant, as patients who experience long waiting times but limited direct interaction with healthcare providers may perceive in-person visits as less efficient or rewarding.

Finally, the concept of “remote monitoring” may not have been interpreted similarly by all participants. Some assumed it referred to telemonitoring, i.e. organised remote video calls with healthcare professionals, while others understood it to mean data collection via an application. Telemonitoring would indeed be an interesting next step to explore, as it would reduce time and costs for patients. However, there would still be the issue of limited availability of healthcare specialists to conduct these remote video calls at fixed times during the day. Finally, another limitation is that the study did not include an economic evaluation from both the healthcare payers’ and the societal perspective.

Moreover, it should be acknowledged that patients’ expressed willingness to participate in remote monitoring, as captured through survey responses, may not fully translate into actual adoption or long-term engagement in real-life settings. While the questionnaire provides valuable insights into patients’ attitudes and intentions, behavioural, logistical, and technological barriers could influence real-world participation once such programs are implemented. Therefore, future studies assessing the practical acceptance, adherence, and sustainability of remote monitoring in daily clinical practice will be crucial to complement these findings.

Setting up a remote monitoring program in a Belgian hospital, a comprehensive large-scale safety and feasibility analysis of remote monitoring within the Belgian healthcare system should be conducted as a first step. It is important to further assess whether remote monitoring is beneficial across all types of centres (large referral centres versus smaller local centres) in Belgium. Patients in smaller local centres probably have shorter travel distances to and from the hospital and therefore

lose less time with an outpatient visit, nevertheless they will also lose some time from work or school.

If a remote monitoring program proves advantageous in all types of centres, the objective will be to extend this approach to all patients with IBD across Belgium. Additionally, in the ATTENDANT study, stable remission was defined as being on stable maintenance therapy, or no therapy, for at least one year. However, if remote monitoring proves to be a safe follow-up method for patients in stable remission, the definition of “stable remission” could be expanded to include patients who have been on maintenance therapy for a shorter period. This is supported by the PREdiCCt study, presented at ECCO 2025, which found that 36% of patients in remission experienced a clinical flare (as measured by the IBD-Control 8 score) within two years. In this study, clinical remission was defined as an IBD diagnosis for at least six months, being asymptomatic for at least one month, and being on stable maintenance therapy for at least two months (11).

Based on the results of the ATTENDANT study and previous literature, some characteristics of patients who may represent an optimal target population for remote monitoring can be suggested. Potential inclusion criteria could include younger age, stable disease and treatment (as newly diagnosed patients may require closer in-person follow-up), and high compliance with therapy, routine consultations, and remote monitoring procedures. Conversely, potential exclusion criteria may include older age (e.g., over 60 years), where technology adoption might be more challenging, and low compliance rates with therapy or follow-up, as these patients may be less likely to engage consistently with remote monitoring programs. While these criteria are preliminary and require validation in future studies, they provide a starting point for identifying patients most likely to benefit from remote monitoring.

Secondly, a health-economic evaluation comparing remote monitoring and standard care in Belgium would be another important endpoint, considering the total cost for the patient and for society for both strategies. From the healthcare payer’s perspective, remote monitoring incurs additional costs, such as IT infrastructure and the salaries of IBD nurses. In a cost-effectiveness analysis, these additional costs should be weighed against the potential benefits, including a reduction in outpatient clinic visits and a decrease in waiting times for new or urgent patients with lower emergency admissions and hospitalisations. From a societal perspective, the most significant benefit is expected to come from reduced absenteeism, as many IBD patients are actively working, with 71% of participants in the ATTENDANT study reporting employment, and 70% of those in employment working full-time. Additionally, two percent of the participants were students. By reducing the need for frequent in-person visits, remote monitoring has the potential to minimize absenteeism from work or school, allowing patients to better manage

their condition without disrupting their professional or educational commitments. This could contribute to improved quality of life and reduced indirect economic and social burdens associated with IBD. Moreover, these patients spend approximately three hours travelling to the outpatient clinic, and remote monitoring could reduce this burden. An economic evaluation will contribute to a comprehensive cost dossier for the healthcare payers, aiming to initiate negotiations with the government regarding reimbursement for the remote monitoring program and funding for IBD nurses in hospitals.

Conclusion

The ATTENDANT study is a progress towards understanding the preferences and needs of patients with stable IBD and exploring how remote monitoring can be optimally integrated into the care paradigm.

This study provides an important first step in the direction of exploring the (long-term) impact of remote monitoring on patient outcomes, healthcare utilisation, and cost-effectiveness in IBD management. Further research is needed to establish best practices for implementing such programs within the Belgian healthcare system, taking into account long-term effectiveness and safety, local infrastructure and patient needs.

Declarations

Conflicts of interest: TS.B., D.B, L.F and M.V. report no conflicts of interest.

S.D. received speakers' fees from Takeda, Galapagos, Alfasigma and Eli Lilly; consultancy fees from Takeda and Janssen.

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Supplementary Table 1: ATTENDANT Questionnaire:

- 1) What is your gender? Female / male / other
- 2) What is your age? <18 years / 18 – 40 years / 40 – 60 years / >60 years
- 3) Do you have Crohn's disease, ulcerative colitis, or IBD type unclassified?
- 4) How long do you have your diagnosis? <5 year / 5 – 10 years / 10 – 20 years / >20 years
- 5) What is your current occupation? Student, actively working, self-employed, looking for a job, disabled, sick leave, retired, other, namely ...
If you have a job:
 - How much are you working? 100% / 80-99% / 60-79% / less than 60%
 - If less than 100%, was this driven by your IBD diagnosis/treatment? Yes / partially / no / other, namely ...
 - Are you skipping work on the day of your outpatient clinic? Yes, a full day but I don't take a day of holiday/ yes, a full day and I take a day of holiday / yes but only for the time I'm travelling or being in the hospital / no / other, namely ...
 If you are still studying: Do you miss classes on the day of your outpatient clinic? Yes, a full day / yes, but only for the time I'm travelling or being in the hospital / no / other, namely ...
- 6) What therapy are you currently receiving and for how long? (See Supplementary Table 2 for multiple choice options)
- 7) Do you regularly have to come to UZ Leuven for other indications than your IBD? No / yes
If yes: namely: ...
how often? ... times per year
- 8) How much is the estimated distance between your home and UZ Leuven? ... kilometres
- 9) How much time do you spend in the hospital for an IBD outpatient clinic on average? ... minutes
- 10) How much time do you spend in total to come to Leuven for an IBD outpatient clinic on average, including the time to travel to and from the hospital, the time in the different waiting rooms and the time you have contact with the IBD team? ... minutes
- 11) How do you come to the outpatient clinic? Bicycle / Car / Foot / Motorcycle / Public transport / Taxi / Other, namely ...
If you are travelling with public transport or taxi: what does a transfer to and from UZ Leuven costs you on average? ... Euro
- 12) Do you work with Mynexuzhealth? Yes/ No/ Not yet, but I'm willing to use it
- 13) Do you currently bring a stool sample every six months? Yes/ Yes, although I'm often forgetting it/ No/ Not yet, but I'm willing to do so
- 14) Would you be interested in coming significantly less often to the outpatient clinic in case you can be followed remotely by the IBD team? Yes, no
If no, why are you not interested?
If yes, would you consider to be followed remotely even if this would mean ...

Coming every year to the outpatient clinic	Yes, No
Coming every two years to the outpatient clinic	Yes, No
Performing a home-based stool analysis for faecal calprotectin every three months	Yes, No
Bringing a stool sample to your general practitioner or a hospital close by every three months	Yes, No
Going to your general practitioner or a hospital close by every year for a blood test	Yes, No
Going to your general practitioner or a hospital close by every three months for additional blood test in case you are using a thiopurine (Azathioprine®, Imuran®, Lanvis®, Puri-Nethol®) or methotrexate (Ledertrexate®, Metoject®, Methotrexate®)	Yes, No
Filling out patient reported outcomes (max. 10 min) through <i>Mynexuzhealth</i> every three months	Yes, No

- 15) In case you are willing to be followed remotely, do you expect the IBD team to contact you after you have provided the patient reported outcome and the results of a faecal calprotectin analysis through Mynexuzhealth? Yes always/ Yes, but only in case of abnormal values/ No/ Other, namely ...
- 16) How would you rate the compliance to your treatment on a scale of 0 (not compliant at all) to 10 (perfect compliance)? VAS scale 0-10
- 17) How will your compliance evolve if you would be followed more remotely, and this on a scale of 0 (will dramatically decrease) over 5 (no impact) to 10 (will dramatically increase)? VAS scale 0-10
- 18) Do you have any concerns about remote monitoring? ... (free text)
- 19) Do you have any further comments about remote monitoring? ... (free text)

Of note: A Dutch, French and English version was available.

Supplementary Table 2: Multiple choice options to answer the question on current IBD treatment and its duration.			
	<i>No</i>	<i>≤1 year</i>	<i>>1 year</i>
Oral mesalamine and sulphasalazine Asamovon®, Claversal®, Colitofalk®, Pentasa®, Salazopyrine®		Excluded	
Corticosteroids Budenofalk®, Clipper®, Entocort®, Medrol®, Solu-Medrol®		Excluded	Excluded
Thiopurines Azathioprine, Imuran®, Lanvis®, Puri-Nethol®		Excluded	
Methotrexate Ledertrexate®, Metoject®, Methotrexate		Excluded	
Intravenous biological Entyvio®, Flixabi®, Inflectra®, Remicade®, Remsima®, Zessly®		Excluded	Excluded
Subcutaneous biological Amgevita®, Benepali®, Cimzia®, Enbrel®, Entyvio®, Erelzi®, Hukyndra®, Hulio®, Humira®, Hyrimoz®, Idacio®, Imraldi®, Nepexto®, Omvoh®, Remsima®, Simponi®, Skyrizi®, Stelara®, Yuflyma®		Excluded	
Small molecule Jyseleca®, Rinvoq®, Velsipity®, Xeljanz®, Zeposia®		Excluded	
Rectal therapy Budenofalk®, Claversal®, Colitofalk®, Entocort®, Pentasa®, magistrale bereidingen			
No IBD-related therapy (of note Imodium®, loperamide and Questran® are NOT regarded IBD-related therapies)		Excluded	
Note: Patients could not see the word “Excluded”. If one of the boxes with “Excluded” was selected, the survey automatically redirected them to a final page thanking them for their participation and informing them that they were not eligible for the study.			

Supplementary Table 3: Reasons and examples of key phrases not to choose for remote monitoring (n = 66 replies).
<p>Preference for in-person contact (30/66 or 45% of responses)</p> <ul style="list-style-type: none"> <input type="checkbox"/> “Face to face is for me important to properly express the problems.” <input type="checkbox"/> “I prefer direct personal contact with my doctor.” <input type="checkbox"/> “I find face-to-face contact more effective than remote consultations.” <input type="checkbox"/> “I much rather prefer to see the IBD team and doctors face-to-face every six months.” <input type="checkbox"/> “I think personal contact is an easier way to discuss difficult topics.”
<p>Concerns about technology (6/66 or 9% of responses)</p> <ul style="list-style-type: none"> <input type="checkbox"/> “I do not have anything online; I use an old mobile phone and do not have a laptop.” <input type="checkbox"/> “I’m not up to date with remote monitoring via computer.” <input type="checkbox"/> “I’m not comfortable with multimedia tools and find remote monitoring difficult.”
<p>Comfort with current healthcare visits (13/66 or 20% of responses)</p> <ul style="list-style-type: none"> <input type="checkbox"/> “I come to the hospital every six months, and that’s not a problem.” <input type="checkbox"/> “I don’t mind coming to Leuven; it feels like a pleasant city trip for me.” <input type="checkbox"/> “I find it convenient to visit the hospital for my check-ups, especially since I’m nearby.” <input type="checkbox"/> “There’s little inconvenience in visiting the doctor in person, and I combine it with other appointments.”
<p>Concerns about the practicalities of remote monitoring (10/66 or 15% of responses)</p> <ul style="list-style-type: none"> <input type="checkbox"/> “Blood tests need to be done elsewhere if remote monitoring is used.” <input type="checkbox"/> “Blood pressure measurements and lab work need to be done in person.” <input type="checkbox"/> “It’s hard to imagine doing certain things, like blood tests, remotely.” <input type="checkbox"/> “Remote monitoring is fine for consultation, but I still need to go to the doctor for tests like blood draws.” <input type="checkbox"/> “I suspect that certain procedures, like blood work, will be difficult to manage through remote monitoring.”
<p>Emotional and psychological comfort (7/66 or 11% of responses)</p> <ul style="list-style-type: none"> <input type="checkbox"/> “For me, it’s important to have personal contact to ensure I am being helped properly.” <input type="checkbox"/> “In my case, having personal consultations gives me mental peace, especially after my cancer history.” <input type="checkbox"/> “Personal contact gives me reassurance that I am being followed closely.” <input type="checkbox"/> “Face-to-face consultations provide comfort and are important for my peace of mind.” <input type="checkbox"/> “It gives me mental comfort to meet my specialist personally. Remote contact feels more distant.”