Received: 13 February 2021 | Accepted: 8 July 2021

DOI: 10.1111/1744-1633.12531

ORIGINAL ARTICLE

WILEY

# The impact and restoration of colorectal services during the coronavirus disease 2019 pandemic: A view from Oxford

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## Abstract

**Aim:** The coronavirus pandemic has significantly disrupted the way we deliver healthcare worldwide. We have been flexible and creative in order to continue providing elective colorectal cancer operations and to restart services for benign cases during the recovery period of the pandemic. In this paper, we describe the impact of coronavirus on our elective services and how we have implemented new patient pathways to allow us to continue providing patient care.

**Patients and Methods:** Data on major colorectal elective resections were prospectively collected in an Enhanced Recovery After Surgery (ERAS) database. Data on the number of proctology cases and telemed appointments were collected from the hospital theatre information management system and electronic patient record system, respectively.

**Results:** During the pandemic, there was a complete shift towards cancer cases, with benign services and proctology cases being placed on hold. Hospital length of stay was reduced. We implemented earlier hospital discharge and more intense telephone follow-up after elective major surgery. This has not resulted in an increase in postoperative complications, nor any increase in readmission to hospital. During the recovery phase, we have introduced a higher proportion of telemed consultations, including one-stop telemed proctology clinics, resulting in straight to tests or investigations.

**Conclusion:** We have created a streamlined multidisciplinary pathway to reinstate our elective colorectal services as soon as possible and to minimise potential harm caused to patients whose treatment have been delayed. We anticipate many of these changes will be permanently incorporated into our clinical practice once the pandemic is over.

KEYWORDS
colorectal, coronavirus pandemic, service recovery

## 1 | INTRODUCTION

Coronavirus disease 2019 (COVID-19) has had a significant global impact on the delivery of elective colorectal surgery.[1–5] There has been a huge challenge in delivering safe care in the treatment of patients with colorectal cancer, and even modest delays can lead to significant impact on survival.[6,7] During the peak of the pandemic, hospitals have been prioritising elective surgery for patients with cancer and delaying

all non-essential surgery for benign conditions. Much of the literature has focussed on guidelines and strategies to maintain services for colorectal cancer throughout the pandemic.[8–11] In the UK, we are now entering the recovery phase of the pandemic, and we are gradually opening up our elective services to meet the clinical needs of all our patients. In this paper, we describe our strategy and the implementation of new patient pathways to help streamline our service.

We are fortunate that our Trust has split sites and therefore we have been able to segregate patients into COVID-positive and COVID-negative cohorts, allowing for safer and more streamlined patient care.[12,13] The John Radcliffe Hospital is for emergencies and for COVID-positive patients, where our Surgical Emergency Unit (SEU) is based. The Churchill hospital is for COVID-negative patients who are screened prior to elective surgery. We are performing day case proctology procedures in COVID-negative screened patients in an independent hospital in Banbury (Foscote Hospital). This has allowed us to safely continue our elective cancer surgery during the pandemic peak and gradually increase our benign colorectal service during the recovery phase of the pandemic.

## 2 | METHODS

Data on major colorectal elective resections were prospectively collected in an Enhanced Recovery After Surgery (ERAS) database, data on the number of proctology cases were collected from the hospital theatre information management system and data on the number of telemed appointments were collected from the electronic patient record system (Cerner Millennium, Kansas City, Missouri). All data points were anonymised prior to analysis. Data were analysed using GraphPad Prism version 8. Mann-Whitney *U* test was performed on nonparametric data.

## 3 | RESULTS

### 3.1 | Elective major resections

Overall, from 1 March to 31 June 2019, in our centre there were 192 elective patients undergoing major surgery, of which 117 were for cancer, 50 for inflammatory bowel disease (IBD) and 25 for benign disease. For the same 5-month period in 2020, there were 133 elective patients, of which 107 were for cancer, 17 for IBD and 9 for benign disease (Figure 1). Although overall numbers of elective patients were reduced during the pandemic, we were able to maintain a similar number of cancer operations. After the national (UK) lockdown on 23 March 2020, we prioritised cancer operations and this was reflected in an increased number of cancer operations in March 2020 and all elective operations in April 2020 were for cancer (Figure 2). In May 2020, there was a reduced number of cancer operations as there were fewer referrals being made through clinic, and fewer cancers being diagnosed due to a reduction in endoscopy services. During the recovery phase of the pandemic, from May to June 2020, we have managed to restart our services for IBD and benign colorectal conditions.

During the peak period, we focussed on cancer patients and dual consultant operating was implemented to increase the throughput of cancer operations. The patient case mix changed and the proportion of patients undergoing operations for IBD and other benign disease reduced, in accordance with The Association of Coloproctology of Great Britain and Ireland (ACPGBI) guidelines.[14] In view of the significantly raised mortality and pulmonary complications in patients undergoing surgery with coronavirus,[15] when this was discussed with patients with benign disease, many opted to defer their operation to a later date. From a management perspective, the patients who were offered a date for surgery but who declined due to risks associated with COVID still counted towards some of the main NHS (National Health Service) targets, including the 52-week target.

The median length of stay for patients was 5 days in the March to July 2019 period, compared with 4 days in 2020 (interquartile range, 4-8 vs 3-6, Mann-Whitney *U* test $P < .0001$; Figure 3) To investigate if this was due to a change in case mix and that we were performing fewer complex IBD operations during the pandemic, we also examined the median length of stay for cancer patients only. This was 6 days for the March to July 2019 period, and 4 days for 2020 (interquartile range, 4-9 vs 3-6, Mann-Whitney *U* test $P < .0001$; Figure 3).

The reduction of hospital length of stay was achieved by discharging patients earlier and following them up carefully in a daily

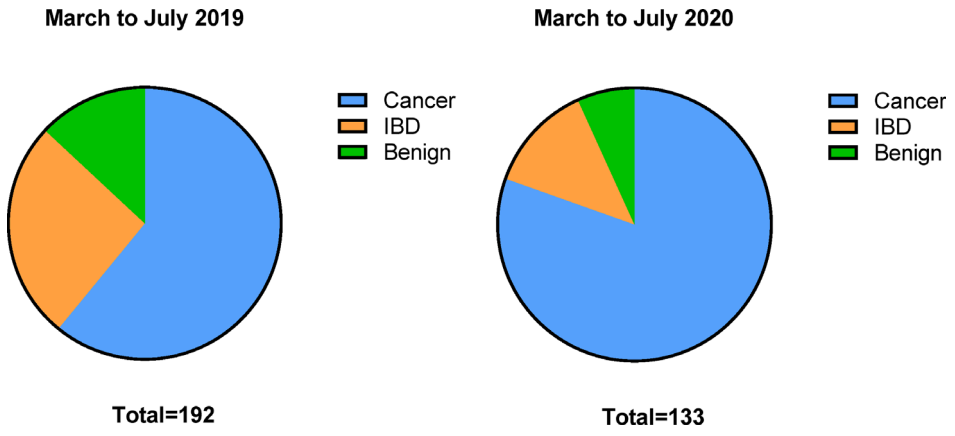



**FIGURE 1** Proportion of elective major cases. IBD, inflammatory bowel disease

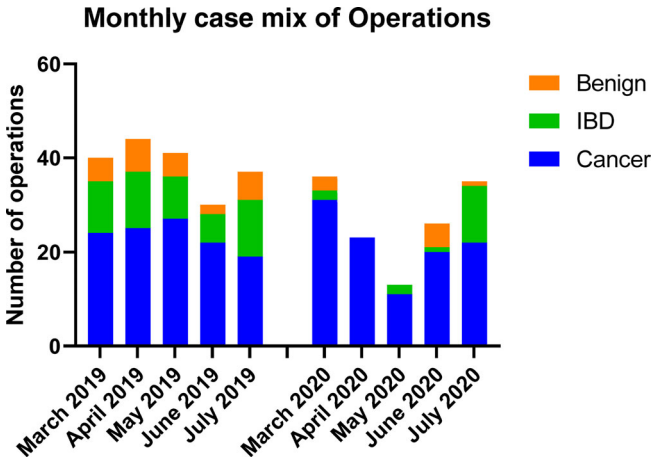
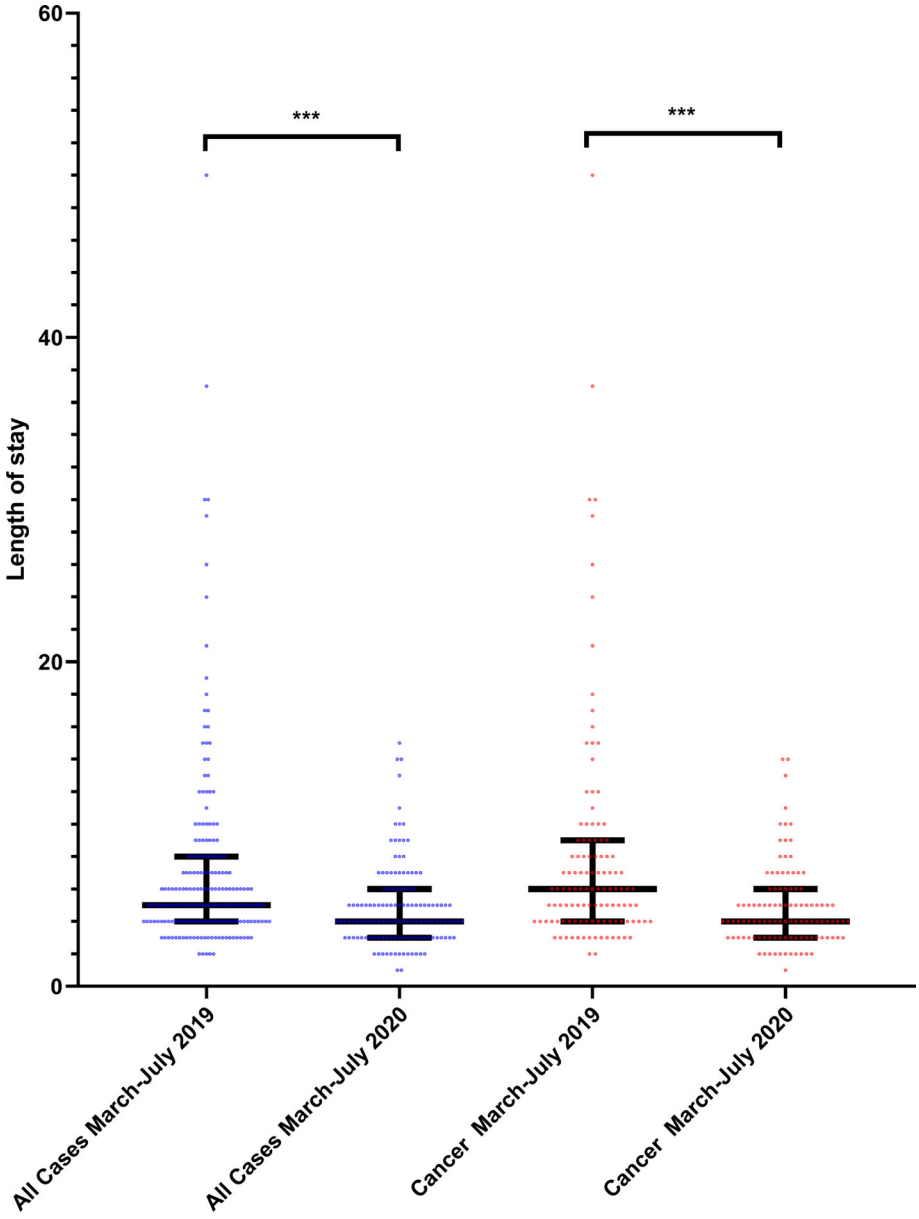



**FIGURE 2** Monthly case mix of major operations. IBD, inflammatory bowel disease

virtual ward round by telephone. These patients also underwent more frequent telephone follow-up by our ERAS nurse specialists upon discharge. Patients were discharged from telephone follow-up when both the patients and clinicians were happy with their recovery progress. If there were any concerns, the patients could contact the surgical team for advice, or they could attend SEU for an urgent face-to-face assessment.

For the same cohort of patients, the readmission rate to SEU was 23/192 (12.0%) in 2019 and 10/133 (7.5%) in 2020 (chi-square test $P = .19$; Figure 4). Our patients underwent more frequent telephone follow-up by our clinicians and by our ERAS nurse specialists with the aim to offer earlier support, advice and enable escalation of any complications or concerns. Overall, we found that our readmission rate during the COVID peak and recovery phase was not statistically different compared with the corresponding period in 2019.

**FIGURE 3** Scatterplot of length of stay for all operations and cancer operations, with median and interquartile range. ***$P < .0001$



The reattendance rate (ie, patients that were seen in SEU but were either discharged or kept on an ambulatory pathway) was 31/192 (16.1%) in 2019 and 9/133 (6.8%) in 2020 (chi-square test $P = .01$). The reduction in reattendance rate may be due to patient anxiety about attending hospital during the peak period. It may also be due to improved ERAS telephone support following discharge from hospital, where patients were signposted to general practitioner for assessment and antibiotic prescriptions for surgical site infections and urinary tract infections, and for wound reviews remotely by the ERAS team.

Examining the readmission and reattendance data on a monthly basis, we observed a reduction in numbers of patients being readmitted and reattending SEU during the peak months of April and May 2020, with a gradual return to pre-COVID-19 levels during the recovery phase of the pandemic (Figure 5). This dip in numbers does mirror the reduced number of operations we were performing during the same period, but it could also be due to patient anxiety about attending hospital during the pandemic. Overall morbidity and mortality were similar across both periods in 2019 and 2020 (Figure 6).

## 3.2 | Proctology cases

Between March 2019 and July 2019, the number of proctology cases performed by our unit ranged from 53 to 68 per month (Figure 7). From 1 March to 22 March 2020, there were 53 proctology cases. From the start of lockdown on 23 March 2020 to the end of the month, there were no further proctology cases. In April and May 2020, there were virtually no proctology cases performed apart from urgent biopsies and cases suspicious for cancer. The number of proctology cases gradually increased during the recovery period of June and July 2020.

## 3.3 | The patient pathway with benign conditions in the recovery phase of the pandemic

Because of the widespread disruption of clinical activity and outpatient services, specific patient pathways have been devised to streamline our service during the recovery period of the pandemic (Figure 8).

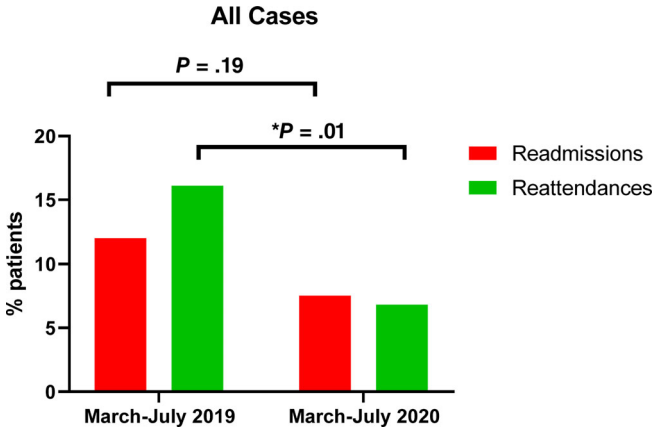



FIGURE 4 Readmission and reattendance rate to Surgical Emergency Unit. *$P < .01$

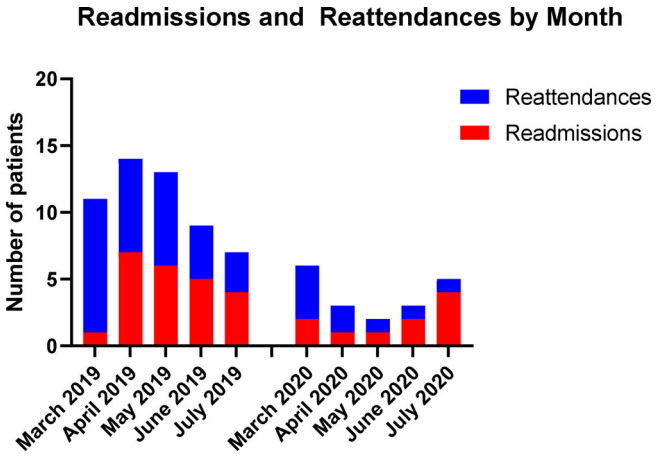



FIGURE 5 Monthly readmission and reattendance rate

Telemed appointments are increasingly used to triage patients and to minimise footfall in hospital. We are also able to provide ongoing virtual colorectal services to selected patients. The outcomes of telemed appointments include bringing patients to clinic face to face, straight to test (computed tomography/magnetic resonance imaging/faecal immunochemical test (FIT)/endoscopy), listing patients for surgery, further telemed appointment and discharge, for patients that have previously been seen in clinic.

We have also introduced one-stop triaging and telemed clinics for proctology patients. (Figure 9). For patients who have symptoms of rectal bleed with no colonic symptoms, and over the age of 40, they are booked straight for flexible sigmoidoscopy. Patients under the age of 40, with no colonic symptoms with or without symptoms of rectal bleed, would be offered an initial telemed consultation. If their history is suggestive of a rectal prolapse, we would arrange for them to have a flexible sigmoidoscopy with or without banding, and refer to our pelvic floor nurse specialists for pelvic floor assessment if required. For patients with haemorrhoids, we would arrange for them to also have a flexible sigmoidoscopy with or without banding. For patients with an unexplained anal mass, we would see them in clinic face to face urgently. For an acute history suggestive of anal fissure, we would trial conservative measures and use of 0.4% glyceryl trinitrate or 2%

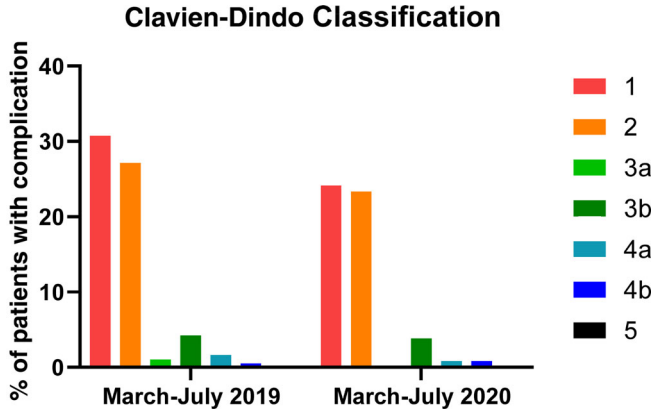



FIGURE 6 Morbidity and mortality

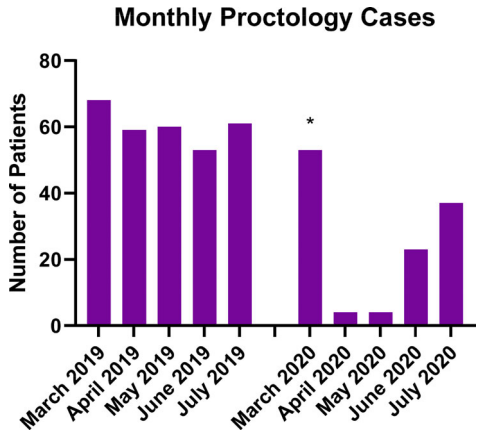



**FIGURE 7** Monthly number of proctology cases. *Zero cases 23-30 March 2020

diltiazem cream and review again in telemed after 2 months. For patients with chronic anal fissures, anal fistula or pilonidal disease, we would arrange for them to have an examination under anaesthesia (EUA) +/− proceed. These pathways are only guidelines. For example, a patient who has had multiple unsuccessful bands previously may benefit from a haemorrhoid artery ligation operation (HALO), and therefore would be booked for a day case procedure rather than another flexible sigmoidoscopy and banding.

Once patients are listed for surgery, they are stratified according to their clinical need and they are also assigned a COVID vulnerability score (ie, the likelihood of a patient having excess mortality due to COVID-19; Figure 10). A fail-safe date for each patient is also documented, ensuring that patients are reviewed by a certain time frame if they have not been operated on or seen again in clinic. These actions enable our department to ensure patients are managed in an appropriate timeframe in order to limit the risk of harm.

Prior to surgery, a patient health screening questionnaire is administered via telephone. In accordance to the latest National Institute for Health and Care Excellence (NICE) guidelines, the patient undergoes comprehensive social-distancing for 14 days prior to their scheduled procedure.[16] They will also undergo a coronavirus swab test within 3 days prior to admission at a drive-in facility to minimise hospital contact, and they are advised to self-isolate from the day of the test until the day of admission.

### 3.4 | Pattern of telemed consultation usage during the pandemic

Virtually all face-to-face clinic appointments were cancelled immediately after the national (UK) lockdown on 23 March 2020. During the peak of the pandemic, there was a complete shift towards telemed consultation, unless a patient needed to be reviewed or seen face to face (Figure 11). During the recovery phase of the pandemic, we have seen a gradual restoration of face-to-face appointments, but telemed appointments still play an important role for patients who are unable to come to hospital for shielding or personal reasons.

There were also significant changes in the provision of stoma specialist nursing. Prior to the lockdown, the majority of stoma patients (82/98, 84%) were seen face to face with the remainder followed up by telemed appointments. Since lockdown in March 2020, virtually all appointments have been telemed. In lieu of formal face-to-face clinic appointments, most patients have been happy to use digital photography to email their stoma pictures for opinion. We are also in the process of starting video consultation with our patients.[17] During the recovery phase of the pandemic, stoma nurses have been arranging

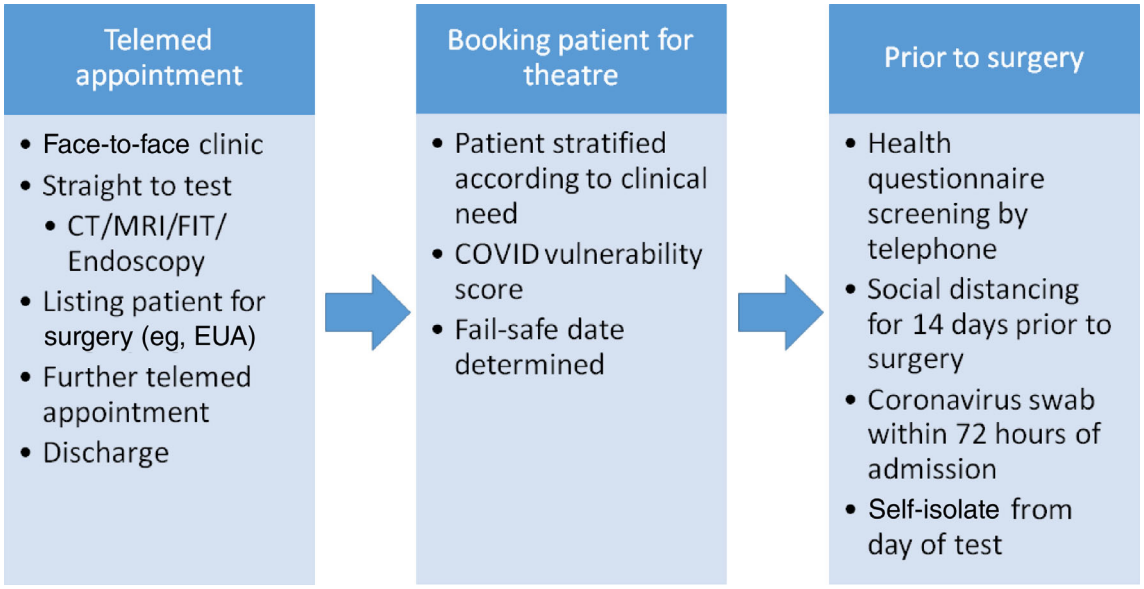



**FIGURE 8** Patient pathway. COVID, coronavirus disease; CT, computed tomography; FIT, faecal immunochemical test; MRI, magnetic resonance imaging

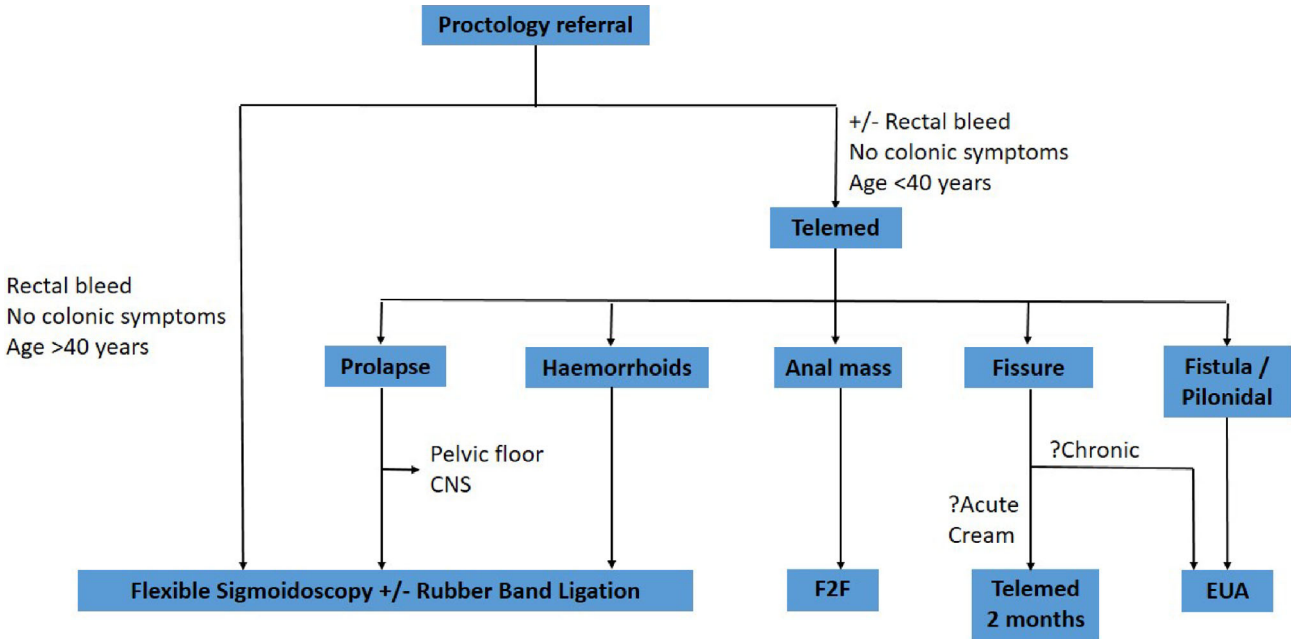



FIGURE 9 Proctology pathway. F2F, face to face; CNS, colorectal nurse specialist; EUA, examination under anaesthesia

**Priority Stratification for Surgical Cases**

| Priority | Timeframe |
|---|---|
| Level 1a | Emergency - Operation needed within 24 hours |
| Level 1b | Urgent - Operation needed within 72 hours |
| Level 2 | Surgery that can be deferred for up to 4 weeks |
| Level 3 | Surgery that can be delayed for up to 3 months |
| Level 4 | Surgery that can be delayed for more than 3 months |

**COVID-19 Vulnerability Group**

| Vulnerability Group | |
|---|---|
| V1 | Unlikely to have excess mortality |
| V2 | Likely to have significant excess mortality |
| V3 | Extremely likely to succumb to COVID infection (eg, age, BAME, associated comorbidities) |

FIGURE 10 Priority stratification and coronavirus disease 2019 (COVID-19) vulnerability. BAME, Black, Asian and minority ethnic

ad hoc face-to-face meetings with patients to tie in with any other hospital appointments they have, for example, in the radiology department or oncology outpatients, thereby streamlining the patient's hospital journey.

There has also been an increased use of telemed and virtual consultation in our patients on the ERAS programme. Prior to the onset of COVID-19, there was an emphasis on patient optimisation prior to surgery. Plans to launch phase 1 of the ERAS Prehabilitation programmes have now been put on hold, and resources have been directed towards supporting more intense ERAS nurse-led follow-up. Wound reviews are now done by email with patients sending in photos which are later uploaded onto their electronic patient record. Patients are now more engaged with their own care, management and recovery, and are eager to be discharged quickly. They feel more empowered and many are doing their own wound management rather than relying on district/practice nurses.

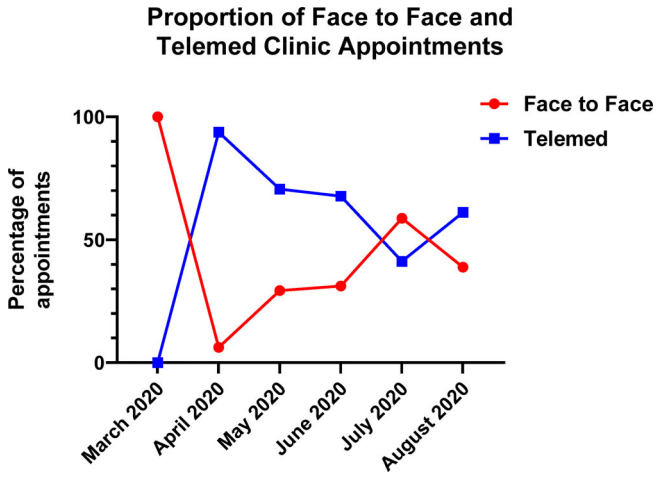



**FIGURE 11** Proportion of clinic appointments by type. Data collected from clinics held on the first Monday of each month

One potential drawback of the increased use of telemedicine is that it does carry a risk of wrong or delayed diagnosis. However, if we were not to offer telemedicine at all, it runs the risk of delaying seeing patients who are otherwise shielding and would not be able to come for a face-to-face clinic appointment. On balance of probabilities, we believe that telemedicine can be a useful tool to help restart services during the recovery period.

In conclusion, the coronavirus pandemic has significantly disrupted the way we deliver health care. We have created a streamlined multidisciplinary pathway in an attempt to reinstate our elective colorectal services as soon as possible and to minimise potential harm caused to patients whose treatment has been delayed.

We have been flexible and creative in order to continue providing elective colorectal cancer operations and to restart services for benign cases during the recovery period of the pandemic. Earlier hospital discharge and more intense telephone follow-up after elective major surgery have not resulted in an increase in postoperative complications, nor any increase in readmission to hospital.

We have also introduced a higher proportion of telemed consultations, including one-stop telemed proctology clinics, resulting in straight to tests or investigations. We anticipate many of these changes will be permanently incorporated into our clinical practice once the pandemic is over.

## ACKNOWLEDGEMENTS

Not applicable.

## CONFLICT OF INTEREST

All authors declare that they have no conflicts of interest.

## AUTHORS' CONTRIBUTIONS

**Trevor Yeung**: study design. **Trevor Yeung**, **Julia Merchant**, **Patrick Chen**, **Corinne Smart**, **Hamira Ghafoor** and **Fran Woodhouse**: Data acquisition. All authors: analysis and interpretation of data, drafting the work and substantial revisions.

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**How to cite this article:** Yeung T, Merchant J, Chen P, et al. The impact and restoration of colorectal services during the coronavirus disease 2019 pandemic: A view from Oxford. *Surg Pract*. 2022;26(1):27-33. doi:10.1111/1744-1633.12531