

## Original research

# JAG/BSG national survey of UK endoscopy services: impact of the COVID-19 pandemic and early restoration of endoscopy services

Jamie Catlow <sup>1</sup>, David Beaton,<sup>1</sup> Iosif Beintaris,<sup>1</sup> Tim Shaw,<sup>2</sup> Raphael Broughton,<sup>2</sup> Chris Healey,<sup>3</sup> Ian Penman <sup>4</sup>, Mark Coleman,<sup>5</sup> Matt Rutter<sup>1</sup>

► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/flgastro-2020-101582>).

<sup>1</sup>Gastroenterology, North Tees and Hartlepool NHS Foundation Trust, Stockton on Tees, UK

<sup>2</sup>Joint Advisory Group on GI Endoscopy, Royal College of Physicians, London, UK

<sup>3</sup>Gastroenterology and Hepatology Services, Airedale General Hospital, Keighley, UK

<sup>4</sup>Centre for Liver & Digestive Disorders, Royal Infirmary of Edinburgh, Edinburgh, UK

<sup>5</sup>Colorectal Surgery, University Hospitals Plymouth NHS Trust, Plymouth, UK

## Correspondence to

Dr Jamie Catlow, Gastroenterology, University Hospital of North Tees, Stockton on Tees, UK; [j.catlow1@ncl.ac.uk](mailto:j.catlow1@ncl.ac.uk)

Received 9 June 2020

Revised 29 June 2020

Accepted 19 July 2020

Published Online First

21 August 2020



© Author(s) (or their employer(s)) 2021. No commercial re-use. See rights and permissions. Published by BMJ.

**To cite:** Catlow J, Beaton D, Beintaris I, *et al.* *Frontline Gastroenterology* 2021;**12**:272–278.

## ABSTRACT

**Introduction** The COVID-19 pandemic has profoundly affected UK endoscopy workload. The Joint Advisory Group on GI endoscopy and British Society of Gastroenterology issued guidelines on endoscopy service delivery changes and restoration. We surveyed UK endoscopy clinical leads to gain insights into service restoration.

**Methods** A Google Forms-designed survey, assessing endoscopy provision, Covid minimisation and referral pathways was circulated to all UK endoscopy leads. The survey was open between 19 and 24 May 2020.

**Results** 97 endoscopy leads completed the survey, with all UK nations and regions represented. Analysis showed 20% of endoscopy services were not providing endoscopy. Workload limitations were due to enforced interprocedural downtime (92%; with some services enforcing >1-hour downtime between procedures), social distancing (88%) and working in personal protective equipment (PPE) (87%). 91% of services reported a referral backlog (urgent median 2 months, routine median 6 months). 96% of services reported no current problems accessing PPE. Level 1/2 PPE use in colonoscopy was not uniform. 63% of services routinely swab patients for COVID-19 before endoscopy, 88% of services do not routinely swab asymptomatic staff. Comments addressed reducing endoscopy demand through vetting and changing referral criteria, the mostly commonly cited strategy being increased faecal immunochemical testing in symptomatic patients (70% of services).

**Conclusion** This survey demonstrates the pandemic's profound impact on UK endoscopy. Challenges include standardising Covid-minimisation strategies and recovering staffing levels. To improve endoscopy services, there is a need to refine referral pathways, improve vetting

## Key messages

### What is already known about this subject?

► COVID-19 has profoundly affected UK endoscopy workload. Joint Advisory Group on GI endoscopy (JAG) and British Society of Gastroenterology (BSG) issued guidelines on service delivery changes and endoscopy restoration.

### What are the new findings?

► COVID-19-related workload limitations were most commonly due to interprocedure downtime, social distancing and working in personal protective equipment (PPE).  
 ► There was a lack of uniformity in services PPE for colonoscopy and routinely swabbing asymptomatic patients and staff for COVID-19.  
 ► Services are considering alternative investigations including faecal immunochemical testing and senior vetting of referrals to reduce demand.

### How might it impact on clinical practice in the foreseeable future?

► JAG and the BSG should clarify guidance on procedure downtime, PPE and COVID-19 testing for services. There is a need to refine endoscopy referral pathways, vetting and use of alternative investigations.

and clarify guidance on downtime and PPE within endoscopy.

## INTRODUCTION

The advent of the COVID-19 pandemic required an urgent need to restructure endoscopy provision in the UK. On the

22 March 2020, a day prior to the national lockdown, the British Society of Gastroenterology (BSG) and Joint Advisory Group (JAG) on gastrointestinal (GI) endoscopy, bodies with responsibility for quality assurance in UK endoscopy,<sup>1</sup> released consensus guidance recommending the cessation of all endoscopy except for emergency procedures or those deemed to be essential.<sup>2</sup> This led to a dramatic reduction in the number of endoscopy procedures undertaken in April 2020, during which the National Endoscopy Database recorded 9877 procedures compared with 152 219 in February 2020.<sup>3,4</sup>

As UK endoscopy moves into the restoration and recovery phases of the COVID-19 pandemic, the challenge becomes how to re-establish endoscopy provision in a safe and structured way. To help facilitate this the BSG and JAG released guidance to support restoration of endoscopy services.<sup>5,6</sup> Endoscopy services face a variety of obstacles in achieving this, with rate-limiting steps likely to be different across UK services.

This national survey of clinical leads aimed to assess adult endoscopy services' current perceptions of workload, identify factors limiting the restoration of services following COVID-19, restructuring and assess changes made to promote Covid minimisation and management of referral pathways.

## METHODS

This national survey looked at practice and issues across UK endoscopy services during the early restoration and recovery phase from the COVID-19 pandemic.

Survey questions were based on recurring themes identified following extensive regional and national teleconferences regarding the effect of the pandemic on endoscopy services. The first survey draft was developed in Google Forms (Google, California, USA; see online supplementary appendix A), and the questions were reviewed and refined following discussion with JAG and the BSG endoscopy committee. A pilot survey was sent to three endoscopy leaders to assess usability, and final adjustments were made.

The final survey was split into three sections, comprising a total of 34 questions (see online supplementary appendix A). The first section looked primarily at endoscopy workload, including assessment of current provision and projected workload in 6 weeks time. This section explored barriers experienced in re-establishing endoscopy delivery and service recovery plans. Services were asked how many procedures are allocated for each 4-hour endoscopy list. Broadly, endoscopy uses a points system for time allocation: an oesophago-gastro-duodenoscopy (OGD) or flexible sigmoidoscopy is allocated one point, a colonoscopy is allocated two points and therapeutic procedures are allocated as required. Most services allocate approximately 12 points to a 4-hour session.<sup>7</sup> Points per week was calculated as the number of lists per week multiplied by the average number of points per

list. The second section explored Covid-minimisation strategies, including assessment of patients' COVID-19 risk/status prior to endoscopic procedures, changes introduced to staffing and endoscopy rooms to minimise transmission risk, and personal protective equipment (PPE) use and availability as recommended by the Public Health England.<sup>8</sup> The third section focused on referral pathways and support. It included questions on changes to investigation and management pathways which services implemented secondary to the COVID-19 pandemic, while also examining areas of endoscopy guidance during the pandemic which recipients felt required further clarity.

On the 19 May 2020, the survey was emailed to all 365 UK clinical leads covering all 498 adult UK endoscopy services registered with JAG, encompassing both the National Health Service (NHS) and independent sector (IS). Due to the time-critical nature of the data collected, the survey closed on midnight on 24 May 2020, giving a total of 5 days for recipients to submit their responses, with a reminder sent on the 22 May 2020. Multiple submissions were permitted where recipients were leads for multiple endoscopy services.

Survey responses were collated and analysed in Microsoft Excel (Microsoft Corporation, Albuquerque, USA; V.16, 2018). Responses were anonymised prior to analysis and converted into this manuscript by the authors. Free-text comments were analysed using a simple thematic analysis where responses were coded and broad themes identified.

## RESULTS

Ninety-seven surveys were completed from a mailing list of 365 endoscopy leads (response rate 27%). All UK regions were represented. Most responses were from NHS endoscopy services (80%); with the remaining 20% from the IS.

### Section 1: endoscopy workload

The 97 endoscopy services were performing a median of 40 points per week (IQR 12–115). They anticipated a threefold increase of service provision in 6 weeks, increasing to 120 points per week (IQR 60–240) (table 1).

Nineteen services (20%) were not providing any endoscopy lists at the time of the survey (figure 1A), comprising 12 IS services (63% of IS services) and 7 NHS services (9% of NHS services). Four services (4%; three IS services and one NHS service) did not anticipate providing any lists in 6 weeks. Services are currently providing a median of 8 lists (IQR 3–18) per week. Eighty-nine per cent of services anticipated providing more lists in 6 weeks, with a projected median of 20 lists per week (IQR 10–34).

Of the services providing lists (n=78), the median points per list was 6 (IQR 5–8), with 40% of services allocating six points per list. At the time of the survey, only four services (5%) allocated 10 points or more

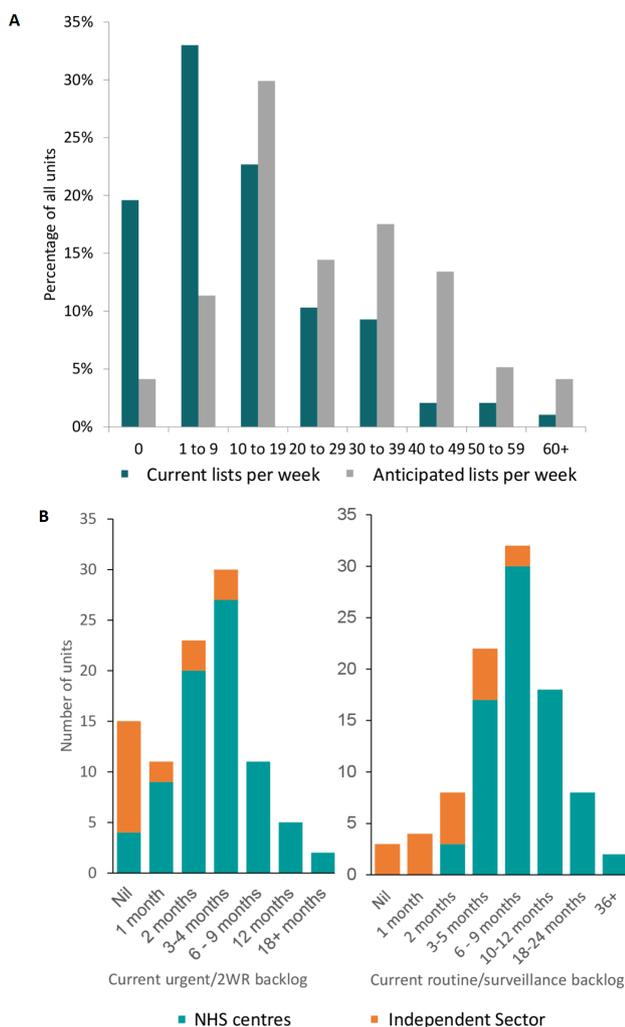
## Endoscopy

**Table 1** Anticipated changes to endoscopy workload (median with IQR)

All services	Current	Anticipated in 6 weeks
Lists per week	8 (3–18)	20 (10–34)
Points per list (excluding those providing 0 lists)	6 (5–8)	8 (6–8)
Points per week	40 (12–115)	120 (60–240)
<b>NHS services</b>		
Lists per week	10 (5–22.5)	28 (10–40)
Points per list (excluding those providing 0 lists)	6 (7.5)	8 (6–8)
Points per week	62 (30–142)	183 (84–299)

NHS, National Health Service.

per list. Of the services that anticipated providing lists in 6 weeks (n=93), the median points per list was projected to be 8 (IQR 6–8); 16 services (17%) anticipated allocating 10 or more points per list.



**Figure 1** (A) Number of endoscopy lists provided per week in each service, current and anticipated in 6 weeks. (B) Current urgent or 2WR, and routine or surveillance referral waiting list backlogs. 2WR, 2 week referrals; NHS, National Health Service.

At the time of the survey, endoscopy services were undertaking endoscopy a median of 5 days per week (IQR 3–5), with 66 services (68%) operating at least 5 days a week. In 6 weeks time, services anticipated operating a median of 5 days per week (IQR 5–6), with 84 services (87%) anticipating operating at least 5 days a week. Eighteen services (19%) aim to be operating a 7-day service.

The most common major issues limiting workload were: reduced list size from enforced downtime (73%), social distancing constraints within services (57%), reduced list size from PPE donning/doffing/comfort constraints (54%) and reduced number of endoscopy nurses (58%). Free-text comments identified the constraints of a lack of infrastructure for COVID-19 swabbing (17 services, 18%) and difficulties planning for restarting serves (11 services, 11%).

### Waiting list backlogs

Seventy-seven services (79%) reported a waiting list backlog for urgent and 2-week referrals, particularly affecting NHS services with 71 services (91%) reporting a backlog. The median duration of backlog was 2 months (IQR 1–4 months, figure 1B). Concerningly, six services (6%) reported urgent referral backlogs of 12 months or longer (ie, significant backlogs even prior to the pandemic).

Ninety-two services (95%) reported a waiting list backlog of patients requiring routine and surveillance procedures, again particularly affecting NHS services (77 services, 99%). The median duration of backlog was 6 months (IQR 4–12 months), with 26 services (27%) reported backlogs of 12 months or longer (figure 1B).

### Endoscopy recovery plan

Ninety-five services (98%) reported having an endoscopy recovery plan. Common aspects of recovery plans (table 2A) included increased clinical vetting of referrals to reduce waiting lists (77%), changing referral pathways to introduce alternative investigations (70%) and restoring normal services quickly (53%).

## Section 2: assessment of COVID-19 risk

### Patient separation

Eighty-seven services (90%) reported some separation of patients by COVID-19 status; however, only 50 services (52%) separated confirmed Covid-negative patients from all other patients, and only 33 (34% of all services) achieved this separation by using a separate unit either within the same organisation or an external organisation.

Overall, 56 services (58%) used separate endoscopy units for patients with COVID-19, whether within the same organisation (43 services) or a different organisation (13 services). Seventeen services (18%) use a separate room within a service, and a further five services (5%) see patients with COVID-19 at the end of a list.

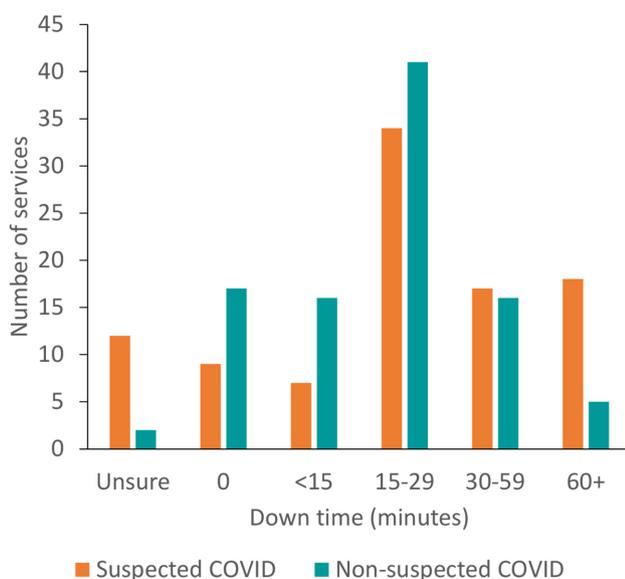
**Table 2** (A) Aspects of endoscopy recovery plans and 2B

A. Aspects of recovery plans (n=97)	Services (%)
Clinically vet referrals to validate cases on endoscopy waiting lists	75 (77)
Change referral pathway (eg, introduce alternative investigations)	68 (70)
Restore normal services as soon as possible	51 (53)
Additional in-house sessions out-of-hours	28 (29)
Use out-sourcing service (send patients to another organisation)	26 (27)
Extended and extra sessions provided in-house due to increased flexibility	26 (27)
Use in-sourcing service (external team coming in) to provide additional sessions	19 (20)
No recovery plan	2 (2)
B. Barriers to COVID-19 testing asymptomatic staff (n=85)	Services (%)
Hospital/organisation unable to support or not routinely testing staff	23 (27)
Hospital/organisation supportive, but unable to get test capacity	20 (24)
Not considered	15 (18)
Considered, but not practical/appropriate in endoscopy	14 (26)
Awaiting decision/unsure	6 (7)
Devolved central government decision	3 (4)
Have not received any relevant guidance from the trust	2 (2)

Barriers to COVID-19 testing of asymptomatic staff services highlighted.

#### Assessing COVID-19 status

Sixty-three per cent of services routinely swabbed patients for COVID-19 before endoscopy. Symptom and temperature checks were used to screen patients either on the day or at a preassessment in 93 services (96%). Most services (71%) advised patients to



**Figure 2** Enforced downtime in between endoscopy patients.

self-isolate prior to procedures: 26 services (27%) advised patients to self-isolate for less than 7 days, 32 services (33%) advise 7–13 days self-isolation, and 11 services (11%) advised patients to self-isolate for 14 days prior to endoscopy.

The most common downtime between procedures reported by services was 15–29 min. Downtimes of over an hour between patients with COVID-19 were reported in 18 services (19%, [figure 2](#)).

#### Separation and swabbing of staff

Seventy-one services (73%) used Covid-minimised areas, of which 29 services (41%) separated endoscopy staff from clinical areas with patients with COVID-19. Ten services are undertaking routine swabs of asymptomatic staff, of which six swabbed staff weekly. Eighty-five services (88%) did not offer routine swabs for asymptomatic staff. The most commonly identified barriers to swabbing asymptomatic staff were the hospital or organisation being unable to support swabbing (27%) and insufficient testing capacity (24%) ([table 2B](#)). At the time of the survey, serological testing was not available nationally.

#### Personal protective equipment

All services implemented level 2 PPE for patients at high risk of COVID-19 attending for upper GI endoscopy and 94 services (97%) for low-risk patients attending for upper GI endoscopy (see question 29. [online supplementary appendix A](#)). The picture is more mixed in lower GI endoscopy, where 88 services (91%) used level 2 PPE for high-risk patients attending for colonoscopy, and 61 services (63%) used level 2 PPE for low-risk patients attending for colonoscopy.

Thirty services (31%) reported PPE shortages at some point, with either a reduction in services (26%) or staff undertaking endoscopy with inappropriate PPE (5%). These shortages of PPE seem to have resolved, with 96% of units reporting no current problems with access to PPE.

#### Section 3: referral pathways and support

Sixty-eight services (70%) increased their use of faecal immunochemical testing (FIT) in symptomatic patients, with just under half describing this as a significant increase ([table 3](#)). The use of CT (not CT colonography (CTC)) has increased in 68 services (70%) for lower GI symptoms and in 59 services (61%) for upper GI symptoms.

Respondents from 73 services (75%) suggested that symptomatic FIT should be used more as an alternative investigation to endoscopy in the future. Although 54 services (56%) suggested CTC should be used more in the future, 7 NHS services commented that current access to CTC had reduced in part due to perceived infection risk.

When asked which aspects of COVID-19 and endoscopy required more national advice and clarification,

**Table 3** Have you increased any of the following investigations for patients referred to endoscopy?

	Significant, %	Somewhat, %	No change, %
Lower GI			
Symptomatic FIT	48 (49)	20 (21)	29 (30)
CT Colonography	9 (9)	20 (21)	68 (70)
CT CAP	35 (36)	33 (34)	29 (30)
Colon capsule	1 (1)	5 (5)	91 (94)
Upper GI			
CT CAP	32 (33)	27 (28)	38 (39)
Barium swallow	19 (20)	28 (29)	50 (52)
Capsule endoscopy	0 (0)	3 (3)	94 (97)

CAP, chest, abdomen, pelvis; FIT, faecal immunochemical testing.

58 services provided free-text comments. The most common themes regarded the use of PPE and the risk of COVID-19 transmission during colonoscopy (21 comments), clarification of COVID-19 testing strategies for patients and staff (18 comments), use of alternative investigations (12 comments) and procedure downtime (11 comments).

Seventy-one services provided free-text comments on how endoscopy should recover. Over half of these (42 comments) addressed reducing endoscopy demand, through changing referral and 2 weeks rule pathways, alternative investigations, stopping BowelScope (flexible sigmoidoscopy) screening, and investing in human resources including funding senior clinicians vetting referrals. Ten comments recommended increasing capacity and 7-day working. Fifteen comments from NHS units suggested investment in more Covid-minimised endoscopy rooms, including mobile or regional endoscopy units. Further investment was recommended in evidence-based medicine and national guidance surrounding COVID-19 and endoscopy (eight comments), PPE and laminar airflow for units (five comments) and increased testing of patients and staff (five comments).

## DISCUSSION

We believe this is the first national survey of endoscopy services addressing the impact of and recovery from the COVID-19 pandemic. It provides insight into the significant reduction in endoscopy activity, the reasons behind this and the substantial, multifactorial challenges that UK endoscopy faces in recovering services.

We identified that, amidst the pandemic, a substantial number of endoscopy services stopped performing endoscopy (20% of all and 9% of NHS services), and those providing a service have reduced both numbers of endoscopy lists (median 10/week) and procedure allocation (median six points/list). This explains the precipitous drop in performed endoscopies in April 2020 to 5% of pre-Covid levels, recovering to around 15% by the time of this survey.<sup>4</sup> There is a growing backlog of urgent, 2 weeks and routine referrals,

affecting 99% of NHS services—indeed, many cited backlogs for routine/surveillance work preceded the COVID-19 pandemic, indicating that some services were struggling to cope with demand even before the pandemic struck. This survey demonstrates that the anticipated recovery speed will be slow: while services anticipated trebling current workload within the next 6 weeks, this would still only amount to under half of pre-Covid endoscopy activity. The implications of this, in terms of delayed cancer (and non-cancer) diagnosis, are increasingly recognised as being a potentially serious impending healthcare crisis.<sup>9 10</sup>

The survey results suggest that despite 31% of services reporting shortages of PPE earlier in the pandemic, access to PPE is no longer an issue for almost all services. However, use of PPE is not uniform across services, with 63% using level 2 PPE for low-risk patients attending for colonoscopy. Many services sought further national clarification on PPE in colonoscopy, which we have identified impacts service capacity: time donning and doffing was cited by the majority as a major limiting factor. Other commonly cited issues limiting workload were reduced list size from enforced downtime (for air-exchange) in between procedure and social distancing constraints within services. Over half of services also noted a reduction in the number of endoscopy nursing staff as being a service constraint.

The BSG and JAG recommend that units prescreen all patients attending for endoscopy to identify those less likely to have COVID-19.<sup>5</sup> While all services are assessing patients for COVID-19 symptoms prior to endoscopy, our survey indicates that only a minority of units have sufficient processes for identifying asymptomatic carriers of COVID-19, a key cause of transmission, and isolating this cohort from proven Covid-negative patients.<sup>11</sup> There was no standardised approach to patient swabbing with 37% of services not routinely swabbing patients, nor to self-isolation. The BSG recommends strict separation of patient flow for patients who potentially have COVID-19.<sup>5</sup> Although 90% of services have some separation of

Covid-positive and Covid-negative patients, there is a lack of uniformity towards patients with unknown COVID-19 status and the location of the Covid-positive endoscopy, and whether these are performed in a different unit (58%), a different room (18%) or at the end of a normal list (5%). Furthermore, virtually no services are routinely and regularly Covid-swabbing asymptomatic endoscopy staff, and most units have not been able to separate endoscopy staff from clinical areas with Covid-positive patients to reduce the potential of staff to patient or staff to staff transmission.<sup>12 13</sup> It is clear from our survey that further national guidance on what constitutes an appropriately Covid-minimised endoscopy service is required. Additional guidance on whether, having implemented such measures, services could relax some of the capacity-limiting measures such as enforced downtime in between procedures, has the potential to substantially accelerate endoscopy recovery.

As increasing service capacity becomes difficult, most services' plans to recover from COVID-19 focus on reducing demand through senior clinicians vetting referrals (77%) and utilisation of alternative investigations in referral pathways (70%). Seventy per cent of all services have increased their use of FIT in symptomatic patients and 75% of services suggested this should be used as an alternative investigation more in the future. The funding of senior clinician time for vetting and triaging should be considered at a national level.

The main limitation of our study is that, as a survey, it is reliant on the responses being representative of UK endoscopy. Due to the time-critical nature of the survey, we set a response deadline of less than a week, and accepted, a priori, a low response rate. Although the survey response rate was only 27% of all endoscopy services in the UK, we believe the 97 responses are likely to be representative of the national picture, covering all UK regions and both NHS and the IS.

In conclusion, this national survey has demonstrated the profound impact that the COVID-19 pandemic has had on UK endoscopy workload, and the substantial challenge our healthcare service faces in restoring and recovering endoscopy services. Major challenges include establishing appropriate Covid-minimised facilities and recovering the current shortfall in endoscopy staffing levels. To improve current UK endoscopy services potential solutions include rapid (but maximally evidence based) refinements to referral pathways, more robust senior clinician vetting of referrals, and, within a carefully Covid-minimised service, refining and clarifying the current COVID-19 restrictions such as enforced downtime and levels of PPE, which would permit substantially increased workload.

**Twitter** Jamie Catlow @drjamiec, Iosif Beintaris @iosifbeintaris and Ian Penman @GastronautIan

**Acknowledgements** Many thanks to the Joint Advisory Group on gastrointestinal endoscopy and the British Society of Gastroenterology.

**Contributors** JC codesigned the survey, undertook response analysis, and co-wrote the manuscript. DB codesigned the survey, undertook analysis and cowrote the manuscript. IB developed the initial survey questions, piloted the survey and edited the manuscript. TS helped develop the survey questions, distributed the survey and edited the manuscript. RB helped develop the survey questions, distributed the survey and edited the manuscript. CH piloted the survey and edited the manuscript. IP helped develop the survey and edited the manuscript. MC helped develop the survey and edited the manuscript. MR codesigned the survey, edited analysis and cowrote the manuscript.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not required.

**Ethics approval** Ethics approval was not required for this survey and all responses were treated confidentially.

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data availability statement** Non-identifiable data are available on reasonable request.

This article is made freely available for use in accordance with BMJ's website terms and conditions for the duration of the covid-19 pandemic or until otherwise determined by BMJ. You may use, download and print the article for any lawful, non-commercial purpose (including text and data mining) provided that all copyright notices and trade marks are retained.

#### ORCID iDs

Jamie Catlow <http://orcid.org/0000-0002-2263-9839>  
Ian Penman <http://orcid.org/0000-0003-0785-6744>

#### REFERENCES

- 1 Siau K, Green JT, Hawkes ND, *et al.* Impact of the joint Advisory group on gastrointestinal endoscopy (JAG) on endoscopy services in the UK and beyond. *Frontline Gastroenterol* 2019;10:93–106.
- 2 British Society of Gastroenterology. Endoscopy activity and COVID-19: Bsg and JAG guidance | the British Society of gastroenterology. Available: <https://www.bsg.org.uk/covid-19-advice/endoscopy-activity-and-covid-19-bsg-and-jag-guidance/> [Accessed 31 May 2020].
- 3 TJW L, Siau K, Esmaily S, *et al.* Development of a national automated endoscopy database: the United Kingdom national endoscopy database (NED). *United Eur Gastroenterol J* 2019;7:798–806.
- 4 NED - National Endoscopy Database. Joint Advisory group on Gi endoscopy. Available: <https://ned.jets.nhs.uk/kpi/> [Accessed 31 May 2020].
- 5 BSG. BSG Guidance on recommending GI Endoscopy in the deceleration & early recovery phases of the COVID-19 pandemic | The British Society of Gastroenterology. Bsg, 2020. Available: <https://www.bsg.org.uk/covid-19-advice/bsg-guidance-on-recommencing-gi-endoscopy-in-the-deceleration-early-recovery-phases-of-the-covid-19-pandemic> [Accessed 31 May 2020].
- 6 JAG endoscopy principles for restoration of endoscopy services following the COVID-19 pandemic, 2020. Available: [www.thejag.org.uk/support](http://www.thejag.org.uk/support) [Accessed 31 May 2020].
- 7 How many 'points' should there be on an endoscopy list? Joint Advisory Group on GI Endoscopy, 2012. Available: <https://thejag.zendesk.com/hc/en-us/articles/360000959073-How-many-points-should-there-be-on-an-endoscopy-list-> [Accessed 4 Jun 2020].

- 8 Public Health England. COVID-19: infection prevention and control guidance. gov.uk, 2020. Available: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/881489/COVID-19\\_Infection\\_prevention\\_and\\_control\\_guidance\\_complete.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/881489/COVID-19_Infection_prevention_and_control_guidance_complete.pdf) [Accessed 3 Jun 2020].
- 9 Sud A, Jones M, Broggio J, *et al.* Quantifying and mitigating the impact of the COVID-19 pandemic on outcomes in colorectal cancer. *medRxiv* 2020. \*Awaiting peer review.
- 10 Roberts K. Impact of coronavirus on cancer services revealed - Cancer Research UK - Science blog, 2020. Available: <https://scienceblog.cancerresearchuk.org/2020/06/01/impact-of-coronavirus-on-cancer-services-revealed-over-2-million-people-waiting-for-screening-tests-and-treatments/> [Accessed 3 Jun 2020].
- 11 Gandhi M, Yokoe DS, Havlir D V. Asymptomatic Transmission, the Achilles' Heel of Current Strategies to Control Covid-19. *N Engl J Med* 2020.
- 12 Shields AM, Faustini SE, Perez-Toledo M, *et al.* SARS-CoV-2 seroconversion in health care workers. *medRxiv* 2020. \*Awaiting peer review.
- 13 Treibel TA, Manisty C, Burton M, *et al.* COVID-19: PCR screening of asymptomatic health-care workers at London Hospital. *Lancet* 2020;395:1608–10.