Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Endoscopy Staff Are Concerned About Acquiring Coronavirus Disease 2019 Infection When Resuming Elective Endoscopy

Douglas K. Rex, Krishna C. Vemulapalli, Rachel E. Lahr, Lee McHenry, Stuart Sherman, and Mohammad Al-Haddad

From the Division of Gastroenterology/Hepatology, Department of Medicine, Indiana University School of Medicine, Indianapolis, Indiana

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As elective endoscopy resumes in the United States, little is known about the concerns of endoscopy staff regarding their risk of acquiring coronavirus disease 2019 (COVID-19) by returning to work. We investigated this issue with a survey of endoscopists and staff at a single academic center delivering outpatient endoscopy services.

Methods

The Indiana University institutional review board approved the survey instrument (Supplementary Table 1) on April 10, 2020. Staff were eligible if they were endoscopists, nurses, technicians, or registration staff and had direct contact with patients. Six research assistants administered all surveys by telephone. The first and final surveys were conducted April 14 and 24, 2020, respectively. After inquiring about protective measures in question 12, each respondent ranked up to 3 protective measures they considered most important. Indiana permitted the resumption of elective surgical procedures, including endoscopy, on April 27, 2020.[1]

Statistical Analysis

To calculate the mean value score for protective measures, we assigned score 0 to *no value*, 1 to *little value*, 2 to *important, should be done,* and 3 to *critical*. When respondents provided up to 3 most important protective measures, we assigned a score of 3 for the top measure, 2 for the second most important, and 1 if a third was ranked.

Chi-squared and Fisher's tests were used as appropriate to compare responses by role (endoscopists vs other staff). McNemar's test was used to compare the level of concern about returning to work before and after critically important safety measures (deemed by each participant) were in place. Significance was set at .05. All analyses were performed with SAS, version 9.4 (SAS Institute, Cary, NC).

Sample Size

There were 140 eligible staff. Assuming 75% of respondents would have high concern for infection with the same safety measures used before the pandemic, a sample size of 100 had a power of 80% to show a 30% decrease in concern after safety measures were implemented (discordant responses, ~50%) at .05 significance.

Results

We reached 106 staff by telephone (28 endoscopists), and the overall participation rate was 94.3%. (Six declined to participate.)

Among respondents, 78 were women. The mean age was 45.9 ± 11.1 years. Eighty-three respondents were married or living with a partner, 60 had children at home, and 8 had parents at home or were caretakers of parents. Twenty-five were endoscopists, 48 were nurses, 16 worked in registration or assessment, and 11 were technicians. Information regarding COVID-19 infection was provided by 67 respondents, of whom 2 (3%) had test-proven symptomatic infection, 4 (6%) had symptoms consistent with COVID-19 without testing, and 61 (91%) had neither symptoms nor positive test results.

When asked whether they would be willing to return to work with the prepandemic safety measures, 36 said yes, 42 said no, and 22 were unsure. Assuming no change in infection control measures, 66% (95% confidence interval, 56.7–75.3) were very or somewhat concerned about returning to work (Supplementary Table 2). Four respondents preferred daily COVID-19 testing, 49 preferred weekly testing, and 47 said it did not matter.

Table 1 shows perceptions regarding specific protective measures. Four measures were ranked as important or critical by ≥90% of respondents: patients wear surgical masks at all times and patients are screened for fever, COVID-19 symptoms, and COVID-19 exposure. However, when respondents ranked the 3 most important measures, the highest scores were for "All patients undergo . . . point of care testing for COVID-19; positives are not allowed to enter" (total score, 135), followed by "All procedure room staff are provided N-95 masks" (total score, 96) and "Patients wear masks from initial contact until discharge . . ." (total score, 80). If all measures considered critical were instituted, the fraction who were very or somewhat concerned was 35% (95% confidence interval, 25.7–45.2), which was lower than the 66% with only pre-COVID measures ($P < .001$).

Abbreviationused in this paper: **COVID-19, coronavirus disease 2019.**

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Table 1. Protective Measures in the Survey and Staff Responses

Measure	Important: score 2	Critical: score 3	Rated important or critical: score 2 or 3	Mean Score[a]	Not sure /don't know	Endoscopists scoring 2 or 3, %	Other staff scoring 2 or 3, %	*P* value, endoscopists compared to staff	Total score from ranking 3 most important factors[b]
Drivers not allowed to enter endoscopy area	52[c]	25[c]	77[c]	2.0	18[c]	80	76	.681	16
Drivers not allowed in the building	31	7	38	1.3	14	40	37.3	.812	6
Patients wear surgical mask from initial contact until discharge except when required	48	44	92	2.4	2	100	89.3	.195	58
All staff wear surgical masks at all times	37	52	89	2.4	1	100	85.3	.061	74
All staff in procedure rooms are provided N-95 masks	31	52	83	2.4	8	100	77.3	.006	95
All patients are screened for fever	21	72	93	2.7	—	92	93.3	1	52
All patients are screened for symptoms of COVID-19	24	74	98	2.7	—	100	97.3	1	80
All patients are screened for exposure to COVID-19	37	53	90	2.4	2	84	92	.263	13
All patients undergo rapid (15 min) point-of-care testing for COVID-19; positives are not allowed to enter	38	48	86	2.4	4	96	82.7	.179	135
All staff are tested daily for COVID-19 infection	32	10	42	1.4	9	28	46.7	.101	13
All staff are tested weekly with a rapid test for COVID-19	34	36	70	2.1	6	76	68	.450	38
All procedure rooms are converted to negative pressure rooms	28	16	44	1.5	18	36	46.7	.352	4
All rooms are allowed to sit for 30 minutes after cleaning before next patient enters	28	16	44	1.6	20	52	41.3	.352	6

[a]Mean response score among those who did not respond *not sure/don't know*.
[b]When respondents were asked to rank up to 3 measures as most critical, the highest-ranked measure was given a score of 3, and any second- and third-ranked measures received scores of 2 and 1, respectively. This column is the sum of all top 3 ranking scores for all 100 respondents.
[c]Number of respondents with a given response. The number scoring *no value* (score 0) or *little value* (score 1) are not shown.

When asked how effective a treatment for COVID-19 should be to eliminate the need for critical protective measures, 35 responded 75% effective, 23 responded 100% effective, 9 said ≤50% effective, and 33 said the measures should be in place regardless of effective treatment. Without an effective treatment or vaccine, 80% anticipated a long-term need for protective measures.

Assuming pre–COVID-19 infection control measures, endoscopists were more often unwilling to return to work compared to nonphysician staff (80% vs 30%; $P < .001$) and were more often very or somewhat concerned (88% vs 59%; $P = .007$). There were 4 measures that 100% of endoscopists considered important or critical (Table 1). N-95 masks were considered important or critical by more endoscopists than other staff ($P = .006$). The fraction considering both patient COVID testing and N-95 masks important or critical was 96% for endoscopists and 66.7% for other staff combined ($P = .004$). With protective measures considered critical in place, the fraction remaining very or somewhat concerned decreased from pre-COVID (from 88% to 28% for endoscopists, $P < .001$; for all others combined from 59% to 37%, $P = .004$).

Discussion

We identified substantial concern among endoscopy staff regarding resuming elective endoscopy and acquiring COVID-19. After instituting new protective measures viewed as critical, 35% remained very or somewhat concerned.

Assuming pre-COVID safety measures, endoscopists expressed greater concern than other staff. This might reflect factors such as greater exposure of endoscopists during procedures compared to other staff, greater awareness of gastrointestinal society recommendations endorsing N-95 masks for endoscopy,[2–5] or other unknown factors. Our survey is not able to explain the differences between endoscopists and other staff, but both groups perceived lower risk associated with new safety measures that they considered critical.

Study strengths include the response rate (94%) and inclusion of staff with a variety of patient care roles. Limitations include the single center, which could limit generalizability. Staff perceptions may change as new information appears.[6] We did not assess the participants' baseline knowledge of COVID-19 facts and infection control recommendations that could have shaped their opinions.

Endoscopy center leaders should be aware of the potential for substantial anxiety among their staff regarding returning to work during the COVID pandemic and consider safety measures and educational programs to reduce potential fears and provide a safe work environment.

Supplementary Material

Note: To access the supplementary material accompanying this article, visit the online version of *Gastroenterology* at www.gastrojournal.org, and at https://doi.org/10.1053/j.gastro.2020.05.038.

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Correspondence
Address correspondence to: Douglas K. Rex, Indiana University Hospital 4100, 550 North University Boulevard, Indianapolis, Indiana 46202. e-mail: drex@iu.edu.

CRediT Authorship Contributions
Douglas K. Rex, MD (Conceptualization: Lead; Investigation: Lead; Methodology: Lead; Project administration: Lead; Supervision: Lead; Writing – original draft: Lead; Writing – review & editing: Lead); Krishna C. Vemulapalli, MBBS, MPH (Conceptualization: Supporting; Formal analysis: Lead; Methodology: Equal; Supervision: Equal; Writing – original draft: Supporting;
Writing – review & editing: Equal); Rachel E. Lahr, BS (Data curation: Lead; Supervision: Supporting; Writing – review & editing: Supporting); Lee McHenry, MD (Conceptualization: Equal; Methodology: Equal; Writing – review & editing: Equal); Stuart Sherman, MD (Conceptualization: Equal; Methodology: Equal; Writing – review & editing: Equal); Mohammad Al-Haddad, MD (Conceptualization: Equal; Methodology: Equal; Writing – review & editing: Equal).

Conflicts of interest
These authors disclose the following: Douglas K. Rex has served as a consultant for Olympus Corporation, Boston Scientific, Medtronic, Aries Pharmaceutical, Braintree Laboratories, Lumendi, Ltd, Norgine, Endokey, GI Supply, and Covidien/Medtronic; has provided research support for EndoAid, Olympus Corporation, Medivators, and Erbe USA Inc; and holds ownership in Satisfai Health. Stuart Sherman has served as a consultant for Olympus Corporation, Cook Medical, and Boston Scientific. Mohammad A. Al-Haddad has received funding and research support from Boston Scientific. The remaining authors disclose no conflicts.

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Supplementary Table 1. The Survey Instrument

Survey of endoscopy staff – return to work during COVID-19

Hi this is _____, research assistant to Dr Rex in the Division of Gastroenterology at Indiana University. I'm calling to ask if you would be able to answer a brief survey on your willingness to return to work after the return of the endoscopy unit's normal functioning hours. This survey is a research study only and is being conducted by Dr Rex. This study was not commissioned by IUH or by the ASCs for making decisions about patient care in the endoscopy units. The results are for research only and should not be expected to influence future policy at the endoscopy units.

Pause for response

I'll be reading some material to you so that the survey questionnaire is standardized. The actual protective steps in place for staff and patients once the endoscopy unit becomes fully operational again are currently under review and will not be determined by the results of this survey. Completing this survey will take us an estimated 5–10 minutes. Your participation is entirely voluntary, and your responses will be kept confidential and anonymous. We hope to talk to about 100 staff members. Are you willing to help us by participating in the survey?

Pause for response

1. Where do you work in the endoscopy unit (if not endoscopist can choose more than one)?
   a. Endoscopist_____
   b. Registration_____
   c. Assessment_____
   d. Room tech (scrub)_____
   e. Room nurse (Cerner entry)_____
   f. Recovery_____
   g. Charge_____
2. Do you have any of the following degrees?
   a. RN _____
   b. BSN or ASN_____
   c. MD_____
   d. PhD _____
   e. CMA or other medical assistant degree_____
3. Your age_____
4. Your gender_____
5. Are you married or living with a significant other?
   a. Yes_____
   b. No_____
6. Have you previously been confirmed to have COVID-19?
   a. Yes_____
   b. No_____
   c. Maybe – I had some symptoms but was not tested_____
7. Do you have children at home?
   a. Yes_____
   b. No_____
8. Do you have parents (either yours or your significant other's) living with you at home?
   a. Yes_____
   b. No_____

To answer the questions below, please assume that we are at a time when we are past the peak of the infection but there is still some risk of acquiring the infection from either patients or fellow staff. Further, assume you have not already been infected and therefore are not immune. Federal or state authorities have indicated it is appropriate for elective procedures to resume. Also assume that no reliably effective treatment for COVID-19 is yet available.

9. Would you be willing to return to work if infection control practices are the same as they were prior to the COVID-19 outbreak (as in February 2020)?
   a. Yes_____
   b. No_____
   c. Not sure_____
10. Please rate your level of concern about returning to work with regard to becoming infected by the virus that causes COVID-19.
   a. Very concerned _____
   b. Somewhat concerned_____
   c. Neutral_____
   d. Only a little concerned_____
   e. Not at all concerned_____
11. How frequently would you like to be tested for COVID-19 (with a rapid test)?
   a. Daily_____
   b. Weekly_____
   c. Doesn't matter_____

For the next questions, please assume there is no widely available effective treatment or vaccine for COVID-19. I'm going to read a series of possible protective steps for staff to you. I'd like you to rate each of these measures with regard to how valuable you perceive the measure for reducing your concern about returning to work. Your choices include: no value, a little value, important—should be done, critical for your confidence, and not sure/don't know.

When we are finished with going through these, I'll ask you to rank the ones that you consider to be the most important for increasing your confidence about the safety of returning to work. Don't worry, I'll read them back to you, so you don't need to try and rank them the first time through.

12. Please rate the value of each of the following measures in reducing your concern about returning to work.

Factor	No value	A little value	Important—should be done	Critical for your confidence	Not sure or don't know	Ranking
Drivers are not allowed to enter the endoscopy area						
Drivers are not allowed in the building						
Patients wear surgical mask from initial contact until discharge (except scope in to scope out for EGD)						
All staff wear surgical masks at all times						
All staff in procedure rooms are provided N-95 masks						
All patients are screened for fever						
All patients are screened for symptoms of COVID-19						
All patients are screened for exposure to COVID-19						
All patients undergo rapid (15 min) point-of-care testing for COVID-19; positives are not allowed to enter						
All staff are tested daily for COVID-19 infection						
All staff are tested weekly with a rapid test for COVID-19						
All procedure rooms are converted to negative pressure rooms						
All rooms are allowed to sit for 30 minutes after cleaning before next patient enters						

Next, I'm going to read the measures back to you. I'd like to you to select up to 3 measures in the order of importance that you consider would be the most reassuring to you and your safety in returning to work while cases of COVID-19 continue. Are you ready?

13. If the measures you consider critical are present when you return to work, please rate your level of concern about acquiring COVID-19 at work.
    a. Very high concern_____
    b. Somewhat concerned_____
    c. Neutral_____
    d. A little concerned_____
    e. Not concerned at all_____

For the next question, please assume that a safe treatment for active COVID-19 infection has become widely available.

1. How effective would the new treatment have to be in reducing mortality for you to feel that the steps you considered critical or important are no longer necessary?
    a. 25% effective_____
    b. 50% effective_____
    c. 75% effective_____
    d. 100% effective_____
    e. It doesn't matter—I still want these steps in place because I don't want to get COVID-19
2. If no completely effective treatment or vaccine is available, do you feel that implementing the above protective measures is necessary as a long-term strategy?
    a. Yes
    b. No
    c. Not sure

Thanks for participating in this research study. The questions in the survey should not be considered to indicate that any of the mentioned steps are either necessary or effective, or that they will be available for use in the endoscopy center. This survey is a research study and should not expected to influence practice in the ASCs.

ASC, ambulatory surgery center; EGD, esophagogastroduodenoscopy; IUH, Indiana University Health; tech, technician.

Supplementary Table 2. Level of Concern About Acquiring COVID-19 Infection by Returning to Work

Level of concern about returning to work with regard to becoming infected with COVID-19	Assuming safety practices of February 2020	Assuming all safety practices considered critical by the respondent are in place
Very concerned	26[a]	11[a]
Somewhat concerned	40	24
Neutral	13	14
Only a little concerned	16	40
Not at all concerned	5	11

[a]Number of respondents with given response.