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.

Endoscopy COVID-19 Testing Requirements Disproportionately Affect Communities That Are Medically Underserved and May Worsen Health Care Disparities

Inequities in health care outcomes among communities that are medically underserved are prevalent in the field of gastroenterology, especially related to cancer prevention and cancer-related morbidity and mortality. Uptake and completion of colorectal cancer (CRC) screening is impacted by patient-, provider-, and system-level factors, such as patient mistrust or fear, financial barriers, and lack of access to specialists and colonoscopy, as well as other barriers (Figure 1).[1] Black patients are less likely to be screened for CRC, are more likely to present with late-stage CRC, and have a lower 5-year survival rate.[1,2] In a telephone survey evaluating disparities in CRC screening, American Indian or Alaska Native (AI/AN), Asian, Hispanic, and Spanish-speaking persons were less likely to be up to date on CRC screening compared with White persons, after adjusting for race and ethnicity, education, and income.[3] CRC screening with the fecal immunochemical test (FIT), one of the most used methods for CRC screening worldwide, can be an inexpensive and easy-to-implement screening mechanism for a large population. However, it is a multistep screening process. For FIT to be effective, a positive result must lead to a diagnostic colonoscopy, and failure to do so is associated with higher rates of CRC mortality.[4] Black and AI/AN persons have lower rates of completing CRC screening with diagnostic colonoscopy after a positive FIT test.[5] In a study evaluating the impact of nonclinical patient navigation on diagnostic colonoscopy after positive FIT, there was increased uptake of diagnostic follow-up; however, colonoscopy was completed in only about one-third of patients.[6] The study demonstrated that although patient navigation can mitigate certain barriers, multilevel barriers exist that impact completion of CRC screening, such as provider knowledge.[6] However, a recent study examining the long-term impact of proactive organized CRC screening using FIT that incorporated centralized tracking, reminders, and alerts for providers and culturally competent and tailored messaging for patients showed remarkable improvements in screening rates for both White and Black persons and dramatic decreases in between-group differences in rates of screening and cancer-specific mortality.[7]

The COVID-19 pandemic has had a significant public health impact, with some racial and ethnic groups being differentially impacted. Persons who are Black, AI/AN, or Hispanic have experienced disproportionately higher rates of SARS-CoV-2 infection, increased disease severity, higher rates of hospitalization, and increased COVID-19–related mortality.[8] Inequities related to social determinants of health, specifically access to health care and economic stability, are important contributors to the higher number of COVID-19–related deaths in these groups.[9] Although the COVID-19 pandemic led to major disruptions in health care delivery, specifically related to endoscopy services, we illustrate how a well-intentioned prevention strategy further exacerbated health care disparities related to endoscopy services among communities that are medically underserved.

SARS-CoV-2 Preprocedure Testing and Endoscopy

Early in the COVID-19 pandemic, the American Gastroenterological Association (AGA) guidelines recommended preprocedure testing for SARS-CoV-2 if the prevalence of asymptomatic SARS-CoV-2 was intermediate (0.5%–2.0%), given the concern for transmission of the virus to health care workers and that some centers had inadequate access to personal protective equipment.[10] As the understanding of SARS-CoV-2 transmission improved, vaccines became available, and viral transmission at the time of endoscopy was found to be very low, the AGA updated their guidelines in 2021.[11,12] The updated AGA guideline for SARS-CoV-2 preprocedure testing made a conditional recommendation against routine preprocedure testing with very low certainty evidence.[12] This recommendation emphasized minimizing delays in care and reducing testing burden on patients. The rationale for this recommendation was made based on evolving data on the prevalence of asymptomatic disease, effectiveness of COVID-19 vaccination on reducing infections, and patients' and health care workers' infections after endoscopy, as well as access to adequate personal protective equipment. In addition, the guideline authors acknowledged that preprocedure testing had the potential to serve as another barrier to care for those who already experience disparities in care.

Despite the updated guidelines, many institutions continue to require preprocedure testing and a negative SARS-CoV-2 test before any medical or surgical procedure, including outpatient ambulatory endoscopy. With prior research demonstrating that Black, AI/AN, and Hispanic communities have limited access to SARS-CoV-2 testing, we aimed to assess the racial and ethnic differences in endoscopy cancellation rates attributable to pre-endoscopy SARS-CoV-2 testing requirements.[2,3]

Impact of SARS-CoV-2 Preprocedure Testing From a Single Center

A retrospective chart review of all consecutive cancelled outpatient endoscopic procedures between March

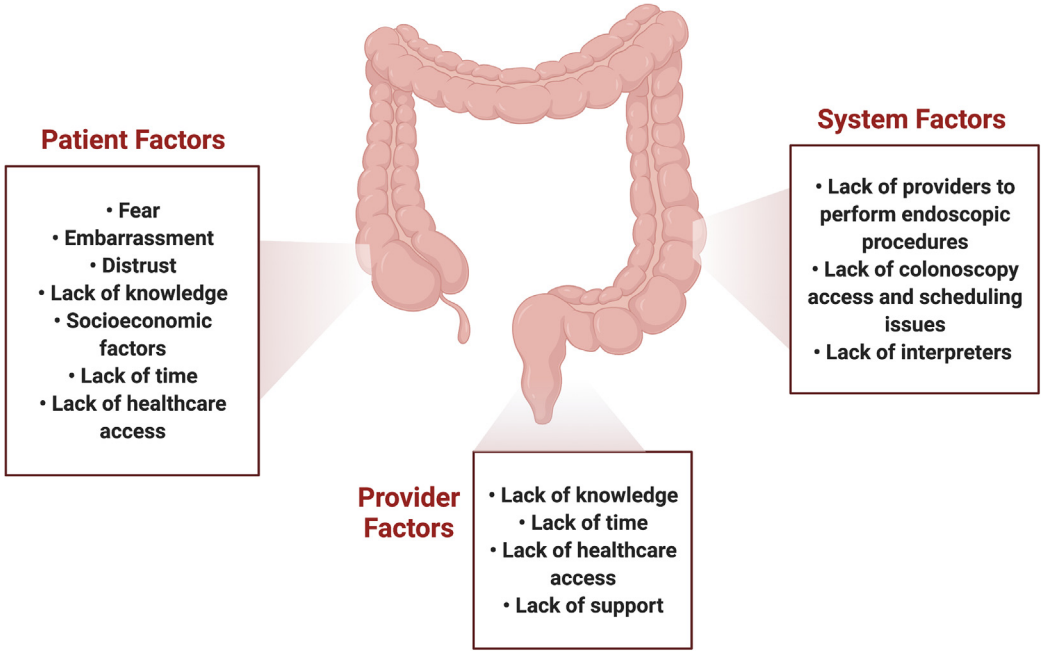

Figure 1. Examples of patient-, provider-, and system-level barriers to colorectal cancer screening.[18,19]

1 and September 7, 2021 at the University of Minnesota Medical Center was performed. The University of Minnesota Medical Center includes 1 hospital endoscopy facility and 2 ambulatory endoscopy centers. During this time, the system mandated a negative SARS-CoV-2 real-time polymerase chain reaction test within 72 hours before endoscopy. As standard of care, endoscopy staff contact all patients and document the reason for cancellation.

Cancellations were only attributed to SARS-CoV-2 testing if endoscopy staff specifically designated SARS-CoV-2 testing as the reason for cancellation. Otherwise, patients unable to be reached by staff, regardless of SARS-CoV-2 testing, or who did not present for the procedure were classified as "no-shows." Cancellations related to SARS-CoV-2 testing included the following: test not completed, test not resulted, patient declined testing, or positive test result. Patient data were extracted from the electronic medical record and included age, race, ethnicity, gender, procedure type and location, primary language, procedure indication, and source of referral. Race and ethnicity data were based on self-report and aggregated into Black, AI/AN, or Hispanic for the purpose of analysis. Language was aggregated into English-speaking or not. Insurance was reported as private, Medicare, Medicaid, or none.

Continuous data were summarized as mean (SD) or proportion. Student *t* test or χ^2 test was used to test for differences between groups, as appropriate. Multiple logistic regression was used to control for potential confounders on race and ethnicity and cancellation. Age, sex, and insurance were included in the model *a priori*. Other variables with $P < .1$ on univariate analysis were included as well. For purpose of regression, insurance was aggregated into private or nonprivate. Planned sensitivity analysis was conducted, assigning those with missing race status as Black and as White. Statistical analyses were performed in R software, version 3.6.0. This project was approved by the Institutional Review Board at the University of Minnesota.

A total of 847 cancelled procedures were identified initially. After excluding repeat patients and erroneous cancellations, 574 unique cases remained for analysis. Demographic characteristics of the analytic cohort can be found in Table 1. Fifty-seven percent (n = 320) of cancellations occurred within 3 days (range, 0–157 days), and 41% (231) of cancellations (or no-shows) occurred on the same day. Ultimately, 8.9% (n = 51) of cancellations were attributed to SARS-CoV-2 testing. Of SARS-CoV-2–related testing cancellations, 82% (n = 42) were related to barriers to completing testing and 18% (n = 9) were related to a positive SARS-CoV-2 test. Of the 9 positive SARS-CoV-2 tests, 2 were in Black patients and 7 were in White patients. Of the remaining cancellations, 51% (n = 292) were patient-initiated, 15% (n = 84) were no-shows, 14% (n = 80) were provider-initiated, and 12% (67) were for miscellaneous reasons.

Cancellations related to testing barriers were reported in 18% of individuals who self-identified as Black, AI/AN, or Hispanic compared with 6.4% for the remainder of the cohort ($P < .001$). Persons who were Black, AI/AN, or Hispanic were significantly more likely to have a preprocedure testing–related cancellation, with an unadjusted odds ratio of 3.2 (95% CI, 1.8– 5.8). Black, AI/AN, or Hispanic race and ethnicity were also associated with an increased no-show risk (27% vs 11%; $P < .001$) and were less likely to cancel preprocedure (36% vs 55%; $P < .001$). There were no differences in provider-related cancellations between groups. After controlling for age, gender, and insurance (private vs nonprivate), Black, AI/AN, or Hispanic race and ethnicity remained a

Table 1. Demographic Characteristics of the Total Cohort (N = 574)

Characteristics	All cancellations	Cancellations related to SARS-CoV-2 testing	Cancellation not related to SARS-CoV-2 testing	*P* value
Patients, n (%)	574 (100)	51 (9)	523 (91)	—
Age, *y*, median (IQR)	56 (47–67)	53 (45–66)	57 (47–67)	.2
Female sex, n (%)	314 (55)	26 (51)	289 (55)	.6
Facility, n (%)				.11
Ambulatory	493 (86)	40 (78)	453 (87)	
Hospital	81 (14)	11 (22)	70 (13)	
Procedure, n (%)				.2
Upper GI[a]	157 (27)	20 (39)	137 (26)	
Lower GI[b]	411 (71)	31 (61)	380 (73)	
Other[c]	6 (1)	0 (0)	6 (1.1)	
Race,[d] n (%)				.001
American Indian or Alaska Native	18 (3.2)	3 (5.9)	15 (2.9)	
Asian	26 (4.6)	1 (2)	25 (4.9)	
Black	93 (16)	18 (35)	75 (15)	
White	428 (76)	29 (57)	399 (78)	
Ethnicity,[e] n (%)				.7
Hispanic/Latino	18 (4.2)	2 (5.1)	16 (4.1)	
Non-Hispanic/Latino	404 (96)	37 (95)	376 (94)	
English as primary language	546 (95)	47 (92)	499 (95)	.3
Insurance, n (%)				.5
Medicaid	19 (3.3)	3 (5.9)	16 (3.1)	
Medicare	113 (20)	8 (16)	105 (20)	
Private	431 (75)	40 (78)	391 (75)	
None	11 (2.1)	0 (0)	11 (2.1)	
Open access procedure, n (%)	360 (63)	35 (69)	325 (62)	.4
Indication, n (%)				.2
Screening	256 (45)	18 (35)	238 (46)	
Diagnostic	318 (55)	33 (65)	285 (54)	

GI, gastrointestinal; IQR, interquartile range.
[a]Included upper endoscopy and endoscopic ultrasound.
[b]Included flexible sigmoidoscopy and colonoscopy.
[c]Included percutaneous endoscopic gastrostomy tube placement, capsule placement, and breath testing.
[d]Nine unknown/unreported race from chart review.
[e]One hundred forty-three unknown/unreported ethnicity from chart review.

significant predictor of SARS-CoV-2 testing–related cancellations (odds ratio, 3.1; 95% CI, 1.7–5.7). Sensitivity analysis with missing race as Black or as White did not change the significance or strength of association.

Preprocedure Testing Requirements Create Additional Barriers to Historically Underserved Populations

Health disparities in the United States, although historically pervasive, have been magnified in the setting of the COVID-19 pandemic.[13] We illustrate how an additional requirement of preprocedure SARS-CoV-2 testing led to higher rates of cancellation among individuals of marginalized groups. Black, AI/AN, and Hispanic persons were 3 times more likely to experience SARS-CoV-2 testing–related endoscopy cancellations, even after controlling for confounding variables. This highlights an evidence-to-implementation gap from the current AGA guidelines on pre-endoscopic testing, as many centers continue to test, despite concerns relating to widening disparities in care.

Although data on the specific barriers that led to this disparity were not collected, multiple factors likely contributed, including patient-, provider-, and system-level factors. Limitations of this study include a retrospective design with potential for residual confounding, single-center study, and small numbers of outcomes. Despite these limitations, these findings are consistent with other studies identifying health care disparities related to CRC screening, especially completion of colonoscopy.

As already noted, access to SARS-CoV-2 testing is not equal across

different racial groups.[1,3] Beyond access to testing, obtaining SARS-CoV-2 polymerase chain reaction testing within 72 hours of endoscopy may require a short-term absence from work or childcare, which may result in a financial burden. There is an additional layer of mistrust—given fear of experimentation, personal discrimination, and historic racial injustices—that negatively impacts access to health care. Black patients are already less likely to be screened for colon cancer than White patients.[1,2,14]

Summary

Barriers that lead to delays in diagnosis and management of gastrointestinal illnesses, importantly, have the potential to lead to higher rates of cancer-related morbidity and mortality.[15] Although total endoscopy volumes were markedly reduced early during the pandemic, routine colonoscopies for screening were most likely considered low priority, resulting in delayed CRC diagnoses.[16] Post pandemic, as efforts to promote and increase access to endoscopic care and delivery for all populations are implemented, it is important to recognize that adding an additional requirement of preprocedure testing may introduce an additional barrier to care and has the potential to introduce or widen existing disparities. There is no clear benefit to preprocedure SARS-CoV-2 testing, yet there is a real risk of unintended harm due to delays in care. As such, we strongly agree with the AGA recommendation and advise health care systems against routine pre-endoscopy testing, irrespective of a patients' vaccination status. Organizations and health systems should prioritize strategies that focus on providing equitable access by eliminating this additional requirement for testing. Any form of testing will continue to add additional barriers. For example, same-day, on-site testing may be more convenient but, if positive, may lead to same-day cancellations. Nonetheless, if a health system opts to continue preprocedure SARS-CoV-2 testing, additional strategies that may potentially mitigate the impact of testing include the following:

- mailing SARS-CoV-2 testing kits to endoscopy patients several weeks preprocedure;
- offering rapid testing on the day of procedure; and
- a mechanism for opting out of testing due to hardship (eg, inability to take time off work or childcare).

CRC is a preventable disease. Despite the known benefits of CRC screening, the proportion of the average-risk US population that is up to date with CRC screening is insufficient, and there are wide disparities in screening rates within communities that are medically underserved.[17] An additional step in the CRC screening pathway, specifically preprocedure SARS-CoV-2 testing, has the potential to widen already known racial disparities in health care access and outcomes. Health care systems must partner with health care providers, community-based leaders, and social service representatives and work to improve access to high-quality care by addressing patient-, provider-, and system-level factors to ensure equitable health care for all.[9]

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Conflicts of interest
This author discloses the following: Byron P. Vaughn has research support from Takeda, Celgene, Roche, and Diasorin and has received consulting fees from Prometheus. The remaining authors disclose no conflicts.

Most current article

0016-5085/$36.00
https://doi.org/10.1053/j.gastro.2022.06.072