A virtual cancer clinic drives increased adherence to cancer screening guidelines in distributed populations

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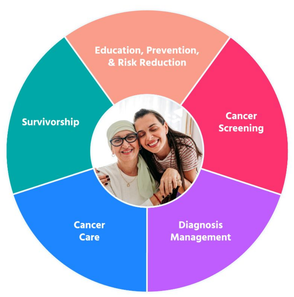
Introduction

In 2024, the United States anticipates over 2 million new cancer diagnoses.[1] Despite continued decline in cancer mortality, reflecting advancements in detection and treatment, cancer incidence rates are rising. This trend is particularly apparent for some of the most common, screenable cancers, including breast, prostate, colorectal, and cervical cancer. Additionally, people are getting diagnosed with cancer at younger ages — for example, the incidence rate of colorectal in those under the age of 55 has increased by 1% to 2% per year since the mid-1990s.[1]

End-to-end cancer care often starts with evidence-based cancer screening, enabling earlier detection and 6-8x increase in survival rates.[2] Unfortunately, cancer screening is often inaccessible and underutilized.

Intervention

Color's virtual cancer clinic, designed in partnership with the American Cancer Society, supports individuals throughout their entire cancer journey—from screening and early detection to care, treatment, and survivorship. In this study, we focused on understanding the impact of a comprehensive virtual cancer clinic on utilization of cancer screening.



Education
Cancer education and awareness that drives >20% engagement rates

Cancer Screening
Increasing screening rates through evidence-based guidelines by better access, stronger management, and faster timelines

Diagnosis Management
Shortening the time to diagnosis through coordinated, managed, and expert care

Cancer Care
Holistic support during treatment - that gets the right clinical care with mental health and logistical support

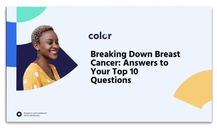
Survivorship
Better support for the silent burden carried by cancer survivors in your workforce

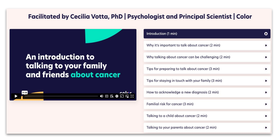
Risk assessment

After enrolling in the program, each participant received a personalized risk assessment for five common cancers—breast, cervical, prostate, colorectal, and lung cancer—based on guidelines from Color's program partner, the American Cancer Society. Participants were then given access to Color's clinical and care navigation teams and either routed to in-person screening options or sent at-home test kits where appropriate. At home-screening was available for cervical, colorectal, and prostate cancer. Following screening, participants were connected to Color's care team to discuss results and determine next steps, including follow-on care and treatment as needed.

Education

All participants had access to Color's educational library, consisting of short videos, guides, classes, and recorded webinars.



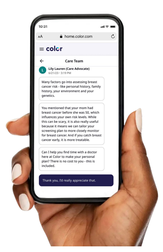


Telehealth medical services

All participants had access to Color's medical team of board-certified clinicians. Participants were offered the option to schedule video or phone visits with clinicians to review their personalized care plans, determine the appropriate at-home and in-person cancer screenings, receive referrals to other care settings when necessary, and address any other cancer-related health concerns.

Care navigation

All participants had access to Color's team of care advocates. Participants could message or speak with a care advocate to identify in-network screening centers, schedule appointments, communicate with their current primary care team, answer questions about screenings, and share relevant resources.



Conclusions

In 8 weeks, Color's virtual cancer clinic doubled or tripled cancer screening adherence rates for breast, cervical, colorectal, lung, and prostate cancer screening.

References

[1] American Cancer Society. Cancer Facts & Figures 2024. Atlanta, GA: American Cancer Society; 2024.

[2] Centers for Disease Control and Prevention. Incidence and Relative Survival by Stage at Diagnosis for Common Cancers. USCS Data Brief, no. 25. Atlanta, GA: Centers for Disease Control and Prevention, US Department of Health and Human Services; 2021.

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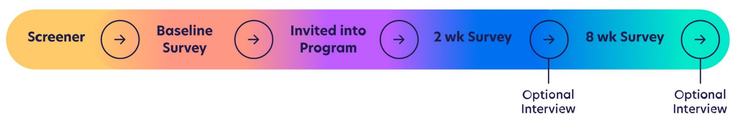
Study Design

We prospectively recruited a study cohort to mimic an average-risk population eligible for standard, evidence-based breast, cervical, colorectal, lung, and prostate cancer screenings recommended by the American Cancer Society. Additionally, eligible participants were required to be between 45 and 65 years of age, have private health insurance, not have a current or former cancer diagnosis, and be behind on one or more cancer screening. Participants located in New York state were excluded due to limitations on at-home screening tests in that state.

After consenting to participate, individuals were asked to complete a baseline survey about their health behaviors and attitudes towards cancer screening. Participants were then invited to use Color's virtual cancer clinic and surveyed about their experience at two weeks and eight weeks post-enrollment. They were also offered the opportunity to take part in two study interviews.



Cancer screening actions taken during the study were measured by self-report and with Color's electronic health records. Cancer screening adherence was calculated based on the American Cancer Society's screening guidelines at baseline (t0) and 8 weeks post-enrollment (t8). Comparisons were calculated using Chi squared tests. Participants were compensated for completing surveys, but they were not compensated for using Color's product.

Table 1. Cancer screening guidelines

Average risk screening guidelines are from the American Cancer Society. Screening recommendations (age to start, stop, and screening cadence) were modified based on an individual's personal and family history.

Cancer	Screening guidelines for average risk participants
Breast	Yearly mammograms starting at age 45. Consider starting at age 40.
Cervical	Starting at age 25. HPV test (every 5 years), or Pap test (every 3 years), or co-test (every 5 years). At-home urine-based HPV testing was available through Color.*
Colorectal	Starting at age 45, screening with FIT (yearly) or colonoscopy (every 10 years).**
Lung* **	Yearly low-dose lung CT, starting at age 50 if 20-pack year smoking history or more.
Prostate	Consider PSA testing starting at age 50.

* Color's urine-based HPV test is not recommended by the American Cancer Society as a substitute for FDA-approved cervical cancer screening.
** In addition to FIT and colonoscopy, the American Cancer Society recommends other colorectal cancer screenings as reasonable alternatives, such as FIT-DNA (i.e. Cologuard).
*** Lung cancer screening is only recommended for those at increased risk. A 20-pack year smoking history is defined as having smoked 0.5 packs of cigarettes per day for 40 years, 1 pack of cigarettes per day for 20 years, 2 packs of cigarettes per day for 10 years.

Table 2. Cohort demographics

100 individuals were invited to participate in the study and 84 enrolled from 29 different US states. The average age of participants was 54.7 years (range: 45-64), 51.2% (n=43) were male, 64.3% (n=54) were non-Hispanic White.

		Total (N=84)
Age at enrollment (years)	Mean (SD)	54.7 (5.4)
	Median	54
	Min - Max	45-64
Sex assigned at birth	Female	41 (48.8%)
	Male	43 (51.2%)
Race/Ethnicity (self-reported)	Asian/Pacific Islander	6 (7.1%)
	Black or African American	13 (15.5%)
	Hispanic or Latino of any race	8 (9.5%)
	Native American or Alaskan	1 (1.2%)
	Other	2 (2.4%)
	White	54 (64.3%)
Education	Didn't finish high school	1 (1.2%)
	Finished high school	3 (3.6)
	Some college	22 (26.2%)
	Undergraduate degree	26 (31.0%)
	Postgraduate degree	29 (24.5%)
	Vocational/trade school	3 (3.6%)
Employment status	Full-time employed	62 (73.8%)
	Part-time employed	12 (14.3%)
	Homemaker	2 (2.4%)
	Unemployed	2 (2.4%)
	Retired	6 (7.1%)
Insurance	Through your place of employment	53 (63.1%)
	Through your place of employment + another source	3 (3.6%)
	Through your spouse's or parent's policy	19 (22.6%)
	Through your spouse's or parent's policy + another source	2 (2.4%)
	Through a policy you purchased yourself	7 (8.3%)
Residence	Midwest	26 (31.0%)
	Northeast	14 (16.7%)
	Southeast	16 (19.0%)
	Southwest	10 (11.9%)
	West	18 (21.4%)

Participant Feedback

"I loved that the information gave me motivation to make appointments I have put off."

"The ease and simplicity of it all, also the 'personal touches' / welcome to the program and ease of setting up the virtual appointment with my assigned Doctor (who was also great)."

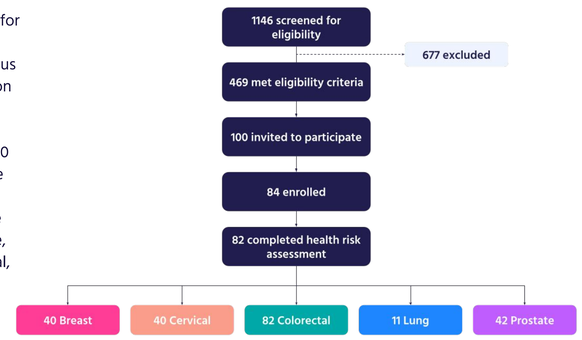
"A care advocate called me...low-key, friendly, pleasant surprise...I'm not just a number in the system."

Results

Figure 1. Study consort diagram

Participants were excluded from the study for multiple reasons including age, insurance type, location in NY state, current or previous cancer diagnosis and/or not being behind on cancer screenings.

Among those that met eligibility criteria, 100 participants were invited to participate. We used quota sampling to generate a diverse cohort. For participants that completed the online health risk assessment questionnaire, applicability of screening for breast, cervical, colorectal, prostate, and lung cancer was determined based on age, sex assigned at birth, and smoking history.

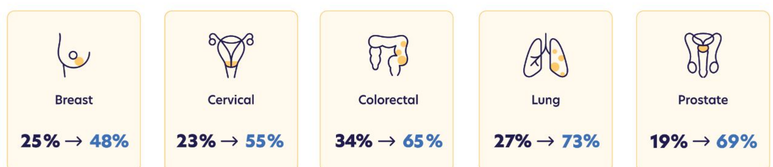


Telehealth medical services
36.6% (n=30) participants completed a consultation with a clinician. Participants reported a high level of satisfaction – 83% of survey respondents found it easy to schedule the virtual visit with a clinician and 94% said that the visit helped them understand the next steps in their cancer screening plan.

Care navigation
43.9% (n=36) participants had a message exchange with a care advocate. The most common reason participants interacted with the care advocate was to ask general questions about the program, followed by having specific questions about their care plan and getting assistance with scheduling in-person screening appointments.

Figure 2. Change in cancer screening adherence

Participant screening adherence rates doubled or tripled in 8 weeks (t0, t8): breast* (25.0%, 47.5%), cervical* (22.5%, 55.0%), colorectal* (34.1%, 64.6%), lung* (27.3%, 72.7%), and prostate* (19.0%, 69.0%). *p <0.01 (Chi-square test)



Surveys

Gaps in education
70%
Before using Color, ~70% of participants did not know the correct age to begin cancer screenings, except for breast cancer

Faster Screening
63%
63% of participants agreed that the program helped them get screened for cancer sooner than they would have otherwise

More likely to screen
76%
76% of participants agreed that they would be more likely to get cancer screening in the future if they had access to this product

Increased knowledge
84%
84% of participants reported that they knew more about when and how often to do cancer screening than before the program

Interest in mental care
90%
90% of participants said they would be interested in emotional or social support if they were to receive a cancer diagnosis

Figure 3. Reasons people were behind on screenings

In the baseline survey (before using the virtual cancer clinic), participants who were behind on screenings indicated there were a variety of reasons they did not want to do a screening. Most often participants were concerned with the discomfort related to the screening (50), worried about what the result might show (42), and about the insurance coverage (28).

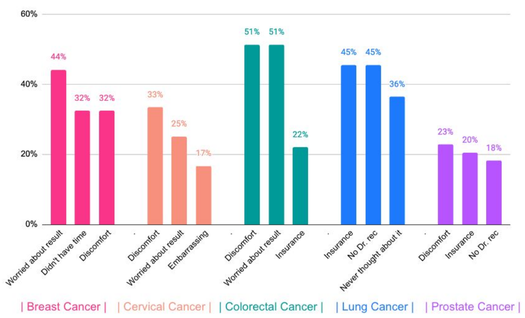


Figure 4. Participant reasons for completing screenings

In the 8 week survey, participants were asked why they completed a cancer screening. The most common answers were "Learning about my cancer risk" and "Learning about my cancer screening recommendations".