Title: Real-World Clinical Outcomes of Blood-Based Colorectal Cancer Screening: Updated Findings on Colonoscopic Follow-Up

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Introduction: Blood-based tests for colorectal cancer (CRC) are emerging as convenient, non-invasive screening options with potential to improve screening participation and outcomes. Like all non-colonoscopic screening tests, blood-based screening is a two-step process in which individuals with an abnormal result must undergo follow-up colonoscopy (FU-CY). It is unclear if individuals who select blood-based screening are likely to complete this critical second step. To gain insight, we analyzed real-world closed claims data to determine the FU-CY rate after an abnormal blood-based test result and identify predictors of FU-CY.

Methods: We conducted a retrospective cohort study of average-risk individuals in the US, aged 45 and older, who received a Shield™ blood-based CRC screening test between May 2022 and September 2024. Shield (Guardant Health) has 83% sensitivity and 90% specificity for advanced neoplasia. Anonymized results were linked to aggregated administrative claims data from a HIPAA-compliant, de-identified database covering 320 million lives. Individuals with less than 6 months of follow-up after their test result were excluded. We summarized sociodemographic characteristics, determined the FU-CY rate, and used multivariable logistic regression to identify predictors of FU-CY within 6 months of an abnormal result.

Results: A total of 6,068 individuals met study inclusion criteria, of which 452 (7.4%) had an abnormal result, and 228 (50.4%) had at least 6 months of follow-up, comprising the cohort of interest. The population had a mean age of 63 years (SD 10.2) and was 37.8% non-Hispanic White, 7.0% non-Hispanic Black, 6.5% non-Hispanic Asian or Pacific Islander, and 16.5% Hispanic (Table 1). There were 111 (49%) individuals who received a FU-CY within 6 months, and mean time to FU-CY was 66.4 days (SD 46.3). Adjusted analysis showed that individuals with Medicare Advantage (aOR=0.26; 95% CI 0.11-0.67) were less likely to undergo FU-CY compared to those with private insurance. Having fewer comorbidities (aOR=0.90; 95% CI 0.82-0.97) was associated with FU-CY at 6 months. Age, race/ethnicity, U.S. census region and insurance plan type were not significant predictors of FU-CY (Table 2).

Discussion: 49% of individuals with an abnormal Shield blood-based CRC screening test result completed colonoscopy within 6 months. This rate is similar to follow-up after abnormal stool-based screening in a recent and similarly-conducted publication using national claims data (48%). Notably, having fewer comorbidities was associated with timely follow-up. As blood-based CRC screening technologies become FDA-approved and adopted by physicians and patients, we must prioritize strategies to ensure timely follow-up, similar to those implemented for stool-based screening tests. Future analyses will assess follow-up rates in larger cohorts and diverse care settings.

Table 1. Sociodemographic characteristics of the study sample, stratified by follow-up colonoscopy status; n=228

	Total (N = 228)		No FU-CY within 6 months after positive Shield (n=117)		FU-CY within 6 months after positive Shield (n=111)		p-value
Mean age, years (SD)	63.0 (10.2)		64.8 (9.9)		61.6 (10.3)		0.0177
Age Group	N	%	N	%	N	%	0.0026
45-49	20	8.7	4	3.4	16	14.4	
50 - 64	115	50.0	56	47.9	59	53.2	
65+	93	40.4	57	48.7	36	32.4	
Gender							0.3611
Female	109	47.4	51	43.6	58	52.3	
Male	108	47.0	59	50.4	49	44.1	
Other/unknown	11	4.8	7	6.0	4	3.6	
Race/Ethnicity							0.7573
Hispanic or Latino	38	16.5	24	20.5	14	12.6	
Asian or Pacific Islander	4	1.7	*3*	2.6	*1*	0.9	
White	14	6.1	*8*	6.8	*6*	5.4	
Other/Unknown	20	8.7	*13*	11.1	*7*	6.3	
Not Hispanic or Latino	135	58.7	68	58.1	67	60.4	
Asian or Pacific Islander	15	6.5	*6*	5.1	*9*	8.1	
Black or African American	16	7.0	*6*	5.1	*10*	9.0	
White	87	37.8	*46*	39.3	*41*	36.9	
Other/Unknown	17	7.4	*10*	8.5	*7*	6.3	
Unknown Hispanic or Latino	55	23.9	25	21.4	30	27.0	
Asian or Pacific Islander	6	2.6	*5*	4.3	*1*	0.9	
Black or African American	7	3.0	*5*	4.3	*2*	1.8	
White	2	0.9	*1*	0.9	*1*	0.9	
Other/Unknown	40	17.4	*14*	12.0	*26*	23.4	
U.S. Census Region							0.198
Midwest	22	9.6	12	10.3	10	9.0	
Northeast	9	3.9	5	4.3	4	3.6	
South	128	55.7	55	47.0	73	65.8	
West	69	30.0	45	38.5	24	21.6	
Unknown	0	0.0	0	0.0	0	0.0	
Insurance							<0.0001
Medicaid	14	6.1	7	6.0	7	6.3	
Medicare Advantage	94	40.9	65	55.6	29	26.1	
Private	120	52.2	45	38.5	75	67.6	
Mean # of Elixhauser comorbidities (SD)	5.6 (4.0)		6.7 (4.3)		4.5 (3.3)		<0.0001

Table 2. Predictors of timely follow-up colonoscopy after an abnormal Shield test result using multivariable logistic regression; n=228

	Adjusted Odds Ratio	95% Confidence Interval
Age	1.033	0.99 – 1.08
Race/ethnicity		
Non-Hispanic White	Reference	Reference
Non-Hispanic Black	1.29	0.43 – 3.89
Non-Hispanic Asian or Pacific Islander	1.28	0.44 – 3.71
Non-Hispanic Other/Unknown	0.86	0.39 – 1.87
Hispanic	0.78	0.32 – 1.92
Insurance		
Medicaid	0.51	0.15 – 1.76
Medicare Advantage	**0.26**	**0.11 – 0.67**
Private	Reference	Reference
U.S. Census Region		
Midwest	1.57	0.48 – 5.13
Northeast	1.10	0.24 – 5.17
South	1.86	0.92 – 3.74
West	Reference	Reference
# of Elixhauser comorbidities	**0.90**	**0.82 – 0.97**

NOTE: bolded values indicate significance at the $p<0.05$ level