Colorectal Cancer Screening with Multi-target stool DNA-based Testing: Previous Screening History of the Initial Patient Cohort

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INTRODUCTION

The U.S. Food and Drug Administration approved the multi-target stool DNA-based test (sDNA)[1] for colorectal cancer (CRC) screening of average risk patients 50 years of age or older in August 2014 (Fig 1 and 2).[2] The Medicare program approved coverage for sDNA use once every 3 years for beneficiaries age 50 to 85 yrs. in October 2014.[3] The aim of our study was to examine the previous CRC screening history of the initial sDNA user cohort.

METHODS

A non-remunerated survey of previous screening methods was conducted December 2014 – May 2015 among a random subset of patients using sDNA. A single laboratory (Exact Sciences Laboratories, LLC, Madison WI), with an in-house patient navigation system (Fig 3-5), provides all U.S. sDNA testing. Clinicians order sDNA and within 48 hours navigators contact patients to explain test processes and to answer any questions. As the initial call ends, navigators randomly invite patients to participate in a two question survey on previous screening history conducted immediately by the navigator. First, had CRC screening been performed previously? Second, if so, how?: with at home fecal occult blood testing (FOBT, guaiac or immunochemical) and/or with endoscopy (colonoscopy or flexible sigmoidoscopy) or with digital rectal examination alone (DRE with or without in-office FOBT; included with “no screening”).

Fig 1. Cologuard Specimen Collection Kit Components

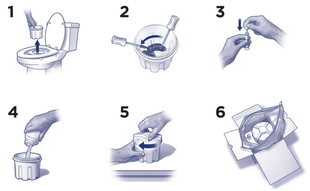
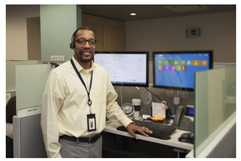
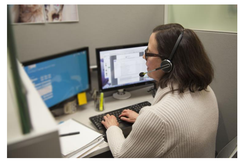


Fig 2. Cologuard Specimen Collection Process Illustration





Figs 3-5. Images of patient navigators from the Exact Sciences Laboratories call center

Table 1. Age and sex distribution of multi-target sDNA test users vs. surveyed sub population

	Kits Shipped (N=40,081)		Users Surveyed (N=2,969)		
Age Range	**n of Users**	**% of Users**	**n Surveyed**	**% Surveyed**	**% of Surveys**
50-64	8,916	22.2%	623	7.0%	21.0%
50-74	28,101	70.1%	2091	7.4%	70.4%
65-74	19,185	47.9%	1468	7.7%	49.4%
75+	11,980	29.9%	878	7.3%	29.6%
Total ≥ 50 yrs.	40,081		2969	7.4%	
Sex			**Sex**		
Male	16,239	41%	1179	7.1%	39.7%
Female	23,842	59%	1790	7.5%	60.3%

Note: For each age group and by sex, there were no significant differences with respect to the number of users and percentage surveyed (p=0.3 by age group and p=0.14 by sex)

Table 2. Multi-target stool-DNA-based colorectal cancer screening: Previous screening history, by age group (N=2,969)

	Age Group (yrs.)									
Previous screening method	**≥ 50**		**50-64**		**50-74**		**65-74**		**≥75**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
NO Screening	1011	34.1%	360	57.8%	816	39.0%	464	31.6%	195	24.0%
NO screening DRE only +/-In-Office FOBT	68	2.3%	15	2.4%	56	2.7%	40	2.7%	12	2.2%
NO Screening	1079	**36.3%**	375	**60.2%**	872	**41.7%**	504	**34.3%**	207	**23.6%**
Home FOBT only	249	**8.4%**	46	**7.4%**	194	**9.3%**	146	**9.9%**	55	**7.0%**
Endoscopy only	1062	35.8%	154	24.7%	695	33.2%	537	36.6%	367	43.4%
Endoscopy + home FOBT only	579	19.5%	48	7.7%	330	15.8%	281	19.1%	249	23.3%
Endoscopy +/- at home FOBT	1641	**55.3%**	202	**32.4%**	1025	**49.0%**	818	**55.7%**	616	**70.2%**
Total	2969	100%	623	100%	2091	100%	1468	100%	878	100%

Margin of error (95% CI) for each method was +/- Less than:
2.6%, 5.4%, 3,0%, 3.6%, and 4.8% for ≥50, 50-64, 50-74, 65-74, ≥ 75 years respectively

RESULTS

Of 40,081 sDNA users 50 years of age and older, 2997 were invited: 28 declined (0.9%) and 2969 (99.1%) participated. Those surveyed (7.4%, 2969/40081), were representative of users overall. There were no significant differences with respect to the percentage of each age group surveyed (≥50, 50-64, 50-74, 65-74, 75 plus yrs. range 7.0 to 7.7% surveyed, p= 0.3) or sex distribution (p=0.14), which was 40% male overall (Table 1). Of the surveyed (N=2969), 36.4% had never been screened previously (“No screening patients”), inclusive of 2.3% who had had only a digital rectal exam (DRE) with or without in-office FOBT, 8.4% used home FOBT alone, and 55.3% used endoscopy alone or in combination with FOBT. The percentage of surveyed sDNA patients who were not previously screened varied with age (p=0.001) with 60%, 42%, 34% and 26% of patients unscreened for ages 50-64, 50-74, 65-74 and 75 plus yrs., respectively. Screening endoscopy use increased with age while FOBT use was fairly constant across age groups. DRE use alone was uncommon at all ages (Table 2).

CONCLUSIONS

Our study shows that a clinically significant proportion of initial sDNA users report no previous CRC screening, especially patients age 74 years and younger (42%). The data suggest that the availability of non-invasive screening with sDNA may increase the pool of screened patients, with a favorable impact on CRC related incidence and mortality.

REFERENCES

1. Imperiale et al New Engl J Med 2014 370(14):1287-1297.
2. U.S. FDA Cologuard Statement of Safety and Effectiveness Data PMA PI30017, 2014 at www.FDA.gov.
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