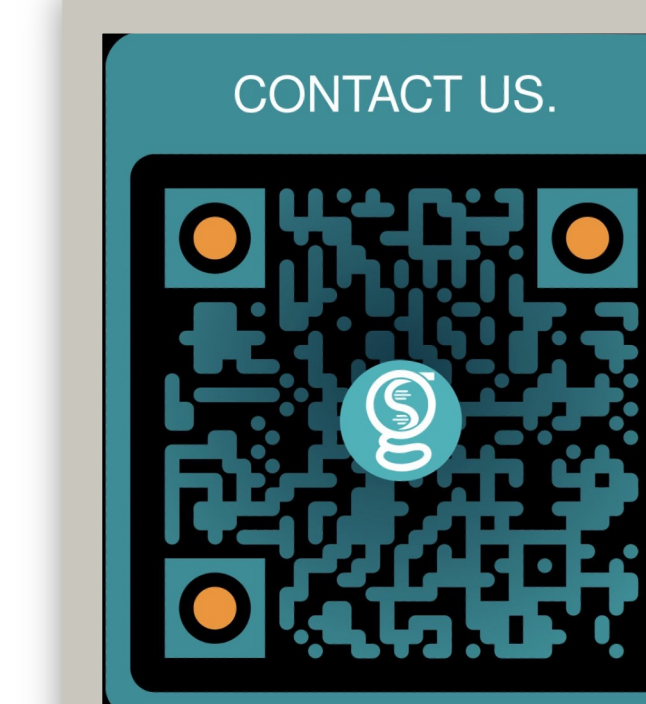


COMPARISON OF COST-EFFECTIVENESS OUTCOMES BETWEEN A NOVEL RNA STOOL TEST AND ALTERNATIVE NON-INVASIVE STOOL AND BLOOD TESTS FOR COLORECTAL CANCER SCREENING

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INTRODUCTION

Colorectal cancer (CRC) mortality has been significantly mitigated by increased CRC screening via colonoscopy. Colonoscopy has low compliance rates due to invasiveness, procedure-associated risks, bowel preparation, and time requirements. Existing non-invasive screening methods are limited by relatively low sensitivity for advanced adenomas (AAs). Using a Markov model, cost-effectiveness outcomes were compared between a novel multitargeted stool RNA (mt-sRNA) test, existing stool-based screening tests (fecal immunochemical test [FIT], and multitarget stool DNA [mt-sDNA]), and a recently introduced triennial blood-based screening test.

METHODS

The model compared morbidity, mortality, and cost using 1,000 average-risk patients 45-75 years of age over a 30-year time horizon. Model inputs included test-specific sensitivity and specificity with fixed incidence and prevalence of CRCs/AAs. Reimbursement rates were assumed equal for blood, mt-sDNA, and mt-sRNA tests (\$508). Data on distribution across disease stages and five-year survival rates predicted long-term outcomes for patients with CRC. The model accounts for cost of screening, complications associated with colonoscopy, surveillance/follow-up requirements, and cost of CRC treatment. For the primary analysis, adherence was assumed to be 100%. For the secondary research, adherence was set at 40%, 60%, and 80%.

RESULTS

At 100% adherence, the mt-sRNA screening strategy resulted in

- An additional reduction in CRC cases by 68.1% (blood test), 42.5% (mt-sDNA test), 30.8% (FIT test).
- Reduction of deaths by 64.7% (blood test), 39.8% (mt-sDNA test), and 29.8% (FIT test) when adherence is set at 40%, 60%, or 80%.
- An increased number of pre-cancerous adenomas detected relative to all other screening strategies.

Adherence rate for all tests	mt-sRNA test vs.	Incremental CRC cases prevented per 1,000 patients	CRC cases reduction (%)	CRC deaths reduction (%)	Incremental costs per CRC case prevented	Incremental costs per CRC case prevented
40%	Blood test	14	39.5%	35.1%	-\$175,379	-\$311,289
	mt-sDNA	6	22.7%	19.9%	-\$168,747	-\$302,667
	FIT	6	21.2%	19.0%	\$8,666	\$14,681
60%	Blood test	16	51.5%	47.0%	-\$182,381	-\$309,202
	mt-sDNA	7	30.8%	27.7%	-\$178,940	-\$293,907
	FIT	5	23.0%	21.2%	\$188,435	\$296,188
80%	Blood test	17	60.3%	56.2%	-\$188,028	-\$306,278
	mt-sDNA	7	37.2%	34.2%	-\$182,141	-\$284,899
	FIT	4	26.1%	24.6%	\$409,606	\$607,669
100%	Blood test	16	68.1%	64.7%	-\$3,104,328	-\$103,478
	mt-sDNA	6	42.5%	39.8%	-\$1,073,985	-\$35,799
	FIT	3	30.8%	29.8%	\$2,289,314	\$76,310

CONCLUSION

This model suggests that utilization of CRC screening tests that target advanced adenoma detection results in a greater reduction in CRC incidence and mortality and offers superior cost-effectiveness due to better cancer prevention. The mt-sRNA test is a cost-effective alternative for colorectal cancer screening in the average-risk population.