

PopSim Effectiveness and Cost Estimates by Intervention

MAILED FIT + PATIENT NAVIGATION

Intervention Effectiveness:

Intervention	Relative Risk	Lower Bound	Upper Bound	Population, Setting and Study Information for Data Sources	Sources
<p>Mailed FIT + patient navigation: The combination of mailed FIT and navigation, as described below. In this intervention, navigators focus more commonly on FIT completion or follow-up after an abnormal FIT.</p> <p>Mailed FIT: Patients receive a notification mailed to their house to alert them that they are due for CRC screening and will be receiving a fecal immunochemical test (FIT) kit in the mail that they can complete at home and return to the clinic via mail (or they can contact the clinic to schedule a colonoscopy). Shortly after, patients receive a package by mail that includes: a low literacy information sheet about CRC and why screening is important, a FIT, directions for how to complete the FIT, and a pre-addressed envelope with a stamp to return the FIT for processing. Patients also receive up to two automated phone calls to remind them to complete the FIT if they have not yet mailed it back.</p> <p>Patient navigation: A trained patient navigator calls eligible patients to help “navigate” them towards getting screened for CRC with the goal of overcoming any barriers to screening, and to support diagnostic testing and treatment initiation. Patients receive individualized assistance such that the navigator's actions are dependent on what each patient needs. Navigation may include explaining why CRC</p>	2.43	2.40	2.55	<p>Gupta et al., 2013:</p> <ul style="list-style-type: none"> • <u>Population:</u> 5,970 uninsured patients aged 54-64, average-risk and due for CRC screening; 64% female; 41% White, 24% Black, 29% Hispanic • <u>Setting:</u> Network of 13 community- and hospital-based primary care clinics and tertiary care hospital in Fort Worth and Tarrant County, TX • <u>Study period:</u> January 2011-February 2012 • <u>Study type:</u> Randomized controlled trial at the patient level comparing a FIT intervention (mailed FIT kit + navigation to diagnostic colonoscopy if positive) vs. a colonoscopy intervention (mailed invitation to schedule a no-cost colonoscopy) vs. usual care <p>Goldman et al., 2015:</p> <ul style="list-style-type: none"> • <u>Population:</u> 420 patients aged 50-75, average-risk and who had never been screened for CRC; 66% female; 62% Latino, 16% White, 16% Black; 71% uninsured, 14% Medicaid enrollees • <u>Setting:</u> Federally qualified health center in Chicago, IL • <u>Study period:</u> November 2001-April 2004 • <u>Study type:</u> Randomized controlled trial at the patient level comparing the intervention (mailed FIT + up to 2 automated calls + up to 2 automated texts + call from navigator if FIT kit not returned) vs. usual care <p>Dougherty et al., 2018:</p> <ul style="list-style-type: none"> • <u>Study type:</u> Systematic review and meta-analysis of randomized controlled trials of interventions to 	Gupta et al., 2013; Goldman et al., 2015; Dougherty et al., 2018

<p>screening is important, describing where and how to get screened, helping to arrange transportation to a screening center, ordering a FIT to the patient's house, and answering questions about CRC screening.</p>				<p>increase CRC screening in average-risk populations and conducted in U.S. clinical settings</p> <ul style="list-style-type: none"> ● <u>Number of studies</u>: 73 total studies, of which 8 studies included patient navigation + fecal test outreach/distribution hand had a low risk of bias ● <u>Effectiveness</u>: Relative risk compared to usual care was 2.01 (95% CI: 1.64-2.46) 	
---	--	--	--	--	--

Intervention Implementation Cost:

Intervention components	Cost per patient	Lower Bound	Upper Bound	Setting and Population Where Costs Were Collected	Sources
<p>FIT kit, excluding the cost of the processing of a completed FIT kit</p>	<p>\$3.27</p>	<p>-</p>	<p>-</p>	<p>Smith et al., 2019:</p> <ul style="list-style-type: none"> ● <u>Setting</u>: Health maintenance organization (Kaiser Permanente Northwest) in southern Washington and northern Oregon ● <u>Population</u>: 3,081 patients aged 50-75, average-risk for CRC screening, and had requested a FIT kit be mailed to them at the end of an automated patient reminder call. Patients were randomized to receive a one-sample FIT kit vs. a two-sample FIT kit in a prior randomized controlled trial (Mosen et al., 2014) ● <u>Notes</u>: Cost of FIT kit was obtained through internal communication with the study team from the trial (Mosen et al., 2014). Estimate for the one-sample FIT kit is included here 	<p>Smith et al., 2019; Mosen et al., 2014</p>
<p>Mailing costs: postage, stamps, envelopes, paper, and materials (letter from provider, fact sheet, instructions for FIT use)</p>	<p>\$1.35</p>	<p>-</p>	<p>-</p>	<p>Smith et al., 2019:</p> <ul style="list-style-type: none"> ● <u>Setting</u>: Health maintenance organization (Kaiser Permanente Northwest) in southern Washington and northern Oregon ● <u>Population</u>: 3,081 patients aged 50-75, average-risk for CRC screening, and had requested a FIT kit be mailed to them at the end of an automated patient reminder call. Patients were randomized to receive a one-sample FIT kit vs. a two-sample FIT kit in a prior randomized controlled trial (Mosen et al., 2014) 	<p>Smith et al., 2019; Mosen et al., 2014</p>

				<ul style="list-style-type: none"> ● <u>Notes</u>: Cost of FIT kit mailing was obtained through internal communication with the study team from the trial (Mosen et al., 2014). This cost includes the initial mailing and the return mailing 	
Project management staff to fill envelopes, manage the project, etc.	\$0.50	-	-	<p>Smith et al., 2012:</p> <ul style="list-style-type: none"> ● <u>Setting</u>: Health maintenance organization (Kaiser Permanente Northwest) in southern Washington and northern Oregon ● <u>Population</u>: 5,905 patients aged 51-80, average-risk, due for CRC screening, and who were randomized to automated telephone outreach (included up to 3 one-minute automated phone calls) vs. usual care in a prior randomized controlled trial (Mosen et al., 2010) ● <u>Notes</u>: Staff costs were estimated using the clinical trial records and time estimates from study staff. Salary costs were assigned using wage estimates from the Bureau of Labor Statistics to increase generalizability. A fringe benefit rate of 30% and overhead rate of 20% were assumed 	Smith et al., 2012
Technical staff to manage automatic calls, maintain the electronic health records, track patients, etc.	\$0.79	-	-	<p>Smith et al., 2012:</p> <ul style="list-style-type: none"> ● <u>Setting</u>: Health maintenance organization (Kaiser Permanente Northwest) in southern Washington and northern Oregon ● <u>Population</u>: 5,905 patients aged 51-80, average-risk, due for CRC screening, and who were randomized to automated telephone outreach (included up to 3 one-minute automated phone calls) vs. usual care in a prior randomized controlled trial (Mosen et al., 2010) ● <u>Notes</u>: Staff costs were estimated using the clinical trial records and time estimates from study staff. Salary costs were assigned using wage estimates from the Bureau of Labor Statistics to increase generalizability. A fringe benefit rate of 30% and overhead rate of 20% were assumed 	Smith et al., 2012
Automated phone reminder to complete FIT , including the cost of developing the automated message	\$0.64	-	-	<p>Smith et al., 2012:</p>	Smith et al., 2012

				<ul style="list-style-type: none"> ● <u>Setting</u>: Health maintenance organization (Kaiser Permanente Northwest) in southern Washington and northern Oregon ● <u>Population</u>: 5,905 patients aged 51-80, average-risk, due for CRC screening, and who were randomized to automated telephone outreach (included up to 3 one-minute automated phone calls) vs. usual care in a prior randomized controlled trial (Mosen et al., 2010) ● <u>Notes</u>: Cost estimate is based on pricing from the in-house vendor of phone messaging services 	
<p>Navigator staff to make the navigation calls; cost includes 45-90 minutes of navigation per patient provided by health educators or community health workers</p>	\$35.41	\$13.50	\$108.03	<p>Lairson et al., 2014:</p> <ul style="list-style-type: none"> ● <u>Setting</u>: 10 primary care practices within a large health network in Delaware ● <u>Population</u>: 945 primary care patients aged 50-79, average-risk, due for CRC screening, and who were randomized to a mailed standard intervention (included a mailed stool kit) vs. a tailored navigation intervention (included the standard intervention plus a nurse navigator call) vs. usual care ● <u>Notes</u>: We used the per-person cost for the intervention call from this study for our cost estimate. This included a structured navigation call conducted by a nurse navigator to confirm receipt of the mailing, address any questions, reassess patients' screening preferences, and encourage participation <p>United States Department of Labor Bureau of Labor Statistics:</p> <ul style="list-style-type: none"> ● <u>Setting</u>: Oregon ● <u>Population</u>: N/A ● <u>Notes</u>: We obtained mean hourly wages for health educators and community health workers in Oregon from the Bureau of Labor Statistics. To obtain the lower and upper bound cost estimates, the wage estimates were multiplied by the number of navigation hours per patient based on additional navigation studies: 	Lairson et al., 2014; Dietrich et al., 2006; Lasser et al., 2011; United States Department of Labor Bureau of Labor Statistics

				<ul style="list-style-type: none"> ○ Dietrich et al., 2006: 4 calls per patient; initial calls were an average of 17 minutes (range: 6 to 48 minutes); subsequent calls were an average of 14 minutes (range: 1 to 62 minutes) ○ Lasser et al., 2011: 6 hours of navigation per patient 	
Technical staff to develop and maintain system, keep track of who is up-to-date on screening and who needs a phone reminder	\$0.79	-	-	<p>Smith et al., 2012:</p> <ul style="list-style-type: none"> ● <u>Setting:</u> Health maintenance organization (Kaiser Permanente Northwest) in southern Washington and northern Oregon ● <u>Population:</u> 5,905 patients aged 51-80, average-risk, due for CRC screening, and who were randomized to automated telephone outreach (included up to 3 one-minute automated phone calls) vs. usual care in a prior randomized controlled trial (Mosen et al., 2010) <p><u>Notes:</u> Staff costs were estimated using the clinical trial records and time estimates from study staff. Salary costs were assigned using wage estimates from the Bureau of Labor Statistics to increase generalizability. A fringe benefit rate of 30% and overhead rate of 20% were assumed</p>	Smith et al., 2012
Navigator training , which can be conducted virtually or in-person;; average cost includes in-person training and travel while lower bound includes virtual training. *Cost is per navigator trained, not per patient.	\$1,123.45	\$500	\$1,500	<p>Patient Navigator Training Programs:</p> <ul style="list-style-type: none"> ● <u>Setting:</u> N/A ● <u>Population:</u> N/A ● <u>Notes:</u> Patient navigator trainings are available across the country and are offered in-person or virtually. Our average cost assumes in-person training with some travel and lodging required. The lower bound estimate assumes a virtual training, while the upper bound assumes higher travel and lodging expenses. We derived these estimates from the following examples of training programs: <ul style="list-style-type: none"> ○ Patient Navigator Training Collaborative: Options include 3-day in-person training (\$750) or 8-week online course (\$500). 	Patient Navigator Training Collaborative; Harold P. Freeman Patient Navigation Institute

				○ Harold P. Freeman Patient Navigation Institute: Provides a 2-day in-person training (\$995)	
Total cost per patient:		\$1,166.20			

References

- Dietrich, A. J., Tobin, J. N., Cassells, A., Robinson, C. M., Greene, M. A., Sox, C. H., . . . Younge, R. G. (2006). Telephone care management to improve cancer screening among low-income women: a randomized, controlled trial. *Ann Intern Med*, *144*(8), 563-571. doi:10.7326/0003-4819-144-8-200604180-00006
- Dougherty, M. K., Brenner, A. T., Crockett, S. D., Gupta, S., Wheeler, S. B., Coker-Schwimmer, M., . . . Reuland, D. S. (2018). Evaluation of Interventions Intended to Increase Colorectal Cancer Screening Rates in the United States: A Systematic Review and Meta-analysis. *JAMA Intern Med*, *178*(12), 1645-1658. doi:10.1001/jamainternmed.2018.4637
- Goldman, S. N., Liss, D. T., Brown, T., Lee, J. Y., Buchanan, D. R., Balsley, K., . . . Baker, D. W. (2015). Comparative Effectiveness of Multifaceted Outreach to Initiate Colorectal Cancer Screening in Community Health Centers: A Randomized Controlled Trial. *J Gen Intern Med*, *30*(8), 1178-1184. doi:10.1007/s11606-015-3234-5
- Gupta, S., Halm, E. A., Rockey, D. C., Hammons, M., Koch, M., Carter, E., . . . Skinner, C. S. (2013). Comparative effectiveness of fecal immunochemical test outreach, colonoscopy outreach, and usual care for boosting colorectal cancer screening among the underserved: a randomized clinical trial. *JAMA Intern Med*, *173*(18), 1725-1732. doi:10.1001/jamainternmed.2013.9294
- Harold P. Freeman Patient Navigation Institute.
- Lairson, D. R., Dicarlo, M., Deshmuk, A. A., Fagan, H. B., Sifri, R., Katurakes, N., . . . Myers, R. E. (2014). Cost-effectiveness of a standard intervention versus a navigated intervention on colorectal cancer screening use in primary care. *Cancer*, *120*(7), 1042-1049. doi:10.1002/cncr.28535
- Lasser, K. E., Murillo, J., Lisboa, S., Casimir, A. N., Valley-Shah, L., Emmons, K. M., . . . Ayanian, J. Z. (2011). Colorectal cancer screening among ethnically diverse, low-income patients: a randomized controlled trial. *Arch Intern Med*, *171*(10), 906-912. doi:10.1001/archinternmed.2011.201
- Mosen, D. M., Liles, E. G., Feldstein, A. C., Perrin, N., Rosales, A. G., Keast, E., & Smith, D. H. (2014). Participant uptake of the fecal immunochemical test decreases with the two-sample regimen compared with one-sample FIT. *Eur J Cancer Prev*, *23*(6), 516-523. doi:10.1097/cej.0000000000000084
- Patient Navigator Training Collaborative.
- Smith, D. H., Feldstein, A. C., Perrin, N., Rosales, A. G., Mosen, D. M., Liles, E. G., . . . Glasgow, R. E. (2012). Automated telephone calls to enhance colorectal cancer screening: economic analysis. *Am J Manag Care*, *18*(11), 691-699.
- Smith, D. H., O'Keeffe Rosetti, M., Mosen, D. M., Rosales, A. G., Keast, E., Perrin, N., . . . Liles, E. G. (2019). Balancing Adherence and Expense: The Cost-Effectiveness of Two-Sample vs One-Sample Fecal Immunochemical Test. *Popul Health Manag*, *22*(1), 83-89. doi:10.1089/pop.2018.0008
- United States Department of Labor Bureau of Labor Statistics. May 2018 State Occupational Employment and Wage Estimates. Oregon.