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# Interventions to Increase Recommendation and Delivery of Screening for Breast, Cervical, and Colorectal Cancers by Healthcare Providers

## Systematic Reviews of Provider Assessment and Feedback and Provider Incentives

Susan A. Sabatino, MD, MPH, Nancy Habarta, MPH, Roy C. Baron, MD, MPH, Ralph J. Coates, PhD, Barbara K. Rimer, DrPH, Jon Kerner, PhD, Steven S. Coughlin, PhD, MPH, Geetika P. Kalra, MPH, Sajal Chattopadhyay, PhD, and the Task Force on Community Preventive Services

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**Abstract:** Most major medical organizations recommend routine screening for breast, cervical, and colorectal cancers. Screening can lead to early detection of these cancers, resulting in reduced mortality. Yet not all people who should be screened are screened, either regularly or, in some cases, ever. This report presents results of systematic reviews of effectiveness, applicability, economic efficiency, barriers to implementation, and other harms or benefits of two provider-directed intervention approaches to increase screening for breast, cervical, and colorectal cancers. These approaches, provider assessment and feedback, and provider incentives encourage providers to deliver screening services at appropriate intervals. Evidence in these reviews indicates that provider assessment and feedback interventions can effectively increase screening by mammography, Pap test, and fecal occult blood test. Health plans, healthcare systems, and cancer control coalitions should consider such evidence-based findings when implementing interventions to increase screening use. Evidence was insufficient to determine the effectiveness of provider incentives in increasing use of any of these tests. Specific areas for further research are suggested in this report, including the need for additional research to determine whether provider incentives are effective in increasing use of any of these screening tests, and whether assessment and feedback interventions are effective in increasing other tests for colorectal cancer (i.e., flexible sigmoidoscopy, colonoscopy, or double-contrast barium enema).  
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### Introduction

Cancer is the second leading cause of death in the U.S.,<sup>1</sup> and breast and colorectal cancers are among the leading causes of cancer deaths.<sup>2</sup> For breast, colorectal, and cervical cancers, screening tests have been shown to reduce cancer-related mortality.<sup>3–6</sup> Furthermore, some screening tests also reduce incidence by detecting pre-neoplastic lesions that can be

removed or treated.<sup>3</sup> The U.S. Preventive Services Task Force (USPSTF) currently recommends breast cancer screening by mammography,<sup>4</sup> cervical cancer screening by Pap test,<sup>6</sup> and colorectal cancer screening by fecal occult blood test (FOBT), flexible sigmoidoscopy, colonoscopy, or double-contrast barium enema.<sup>5</sup>

It has been estimated that each year 4475 breast cancer deaths, 3644 cervical cancer deaths, and 9632 colorectal cancer deaths could be prevented if all eligible Americans received appropriate cancer screening services.<sup>7</sup> Yet age-adjusted data from the 2005 National Health Interview Survey<sup>8</sup> showed that only 67% of women aged  $\geq 40$  years reported mammograms within the previous 2 years, and only 78% of women aged  $\geq 18$  reported Pap tests within the previous 3 years. Among adults aged  $\geq 50$  years, only 50% reported ever having endoscopies, and only 17% reported an FOBT within the previous 2 years. Furthermore, recent evidence suggests that mammography rates may be declining,<sup>9</sup> Pap test rates are not increasing,<sup>10</sup> and less than half of the eligible population received recent

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From the CDC Community Guide Branch, National Center for Health Marketing (Habarta, Baron, Chattopadhyay, Kalra) and the CDC Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion (Sabatino, Coates, Coughlin), Atlanta, Georgia; the University of North Carolina School of Public Health (Rimer), Chapel Hill, North Carolina; and the National Cancer Institute, National Institutes of Health (Kerner), Bethesda, Maryland. Author affiliations are shown at the time the research was conducted.

The names and affiliations of the Task Force members are listed at the front of this supplement and at [www.thecommunityguide.org](http://www.thecommunityguide.org).

Address correspondence and reprint requests to Susan Sabatino, MD, MPH, Division of Cancer Prevention and Control, CDC, 1600 Clifton Road, MS K-53, Atlanta GA 30333. E-mail: [SSabatino@cdc.gov](mailto:SSabatino@cdc.gov).

colorectal cancer screening.<sup>11</sup> Screening efforts face the additional challenge of assuring that cancer screening, once initiated, is repeated at recommended intervals.<sup>12,13</sup> Increasing screening use overall and reducing gaps in screening use are important steps toward reducing cancer mortality.

Many community- and systems-based interventions to promote cancer screening are available to programs and planners. These interventions can target clients and communities (client-directed) or providers and health systems (provider-directed). Although similar interventions have been applied to promote use of other healthcare services,<sup>14</sup> their effectiveness, applicability, cost, and cost effectiveness for increasing cancer screening rates are either not clearly established or not completely understood.

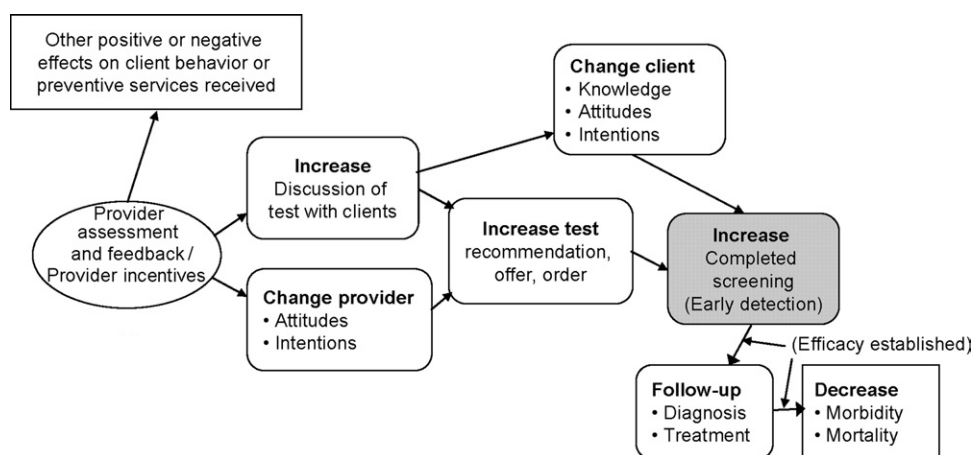
The *Guide to Community Preventive Services (Community Guide)*, developed by the independent, nonfederal Task Force on Community Preventive Services (the Task Force), has conducted systematic reviews on the effectiveness of community interventions to increase screening for breast, cervical, and colorectal cancers.<sup>15</sup> The conceptual approach and selection of interventions for these reviews focused on three primary strategies to increase screening: increasing community demand for screening, reducing access barriers, and increasing delivery of these services by healthcare providers. The first two strategies encompass client-directed approaches intended to influence client knowledge, motivation, and decision to be screened at appropriate intervals. The third strategy encompasses provider-directed approaches to encourage providers to deliver screening services at appropriate intervals. Evidence from these reviews provides the basis for Task Force recommendations of interventions and for identifying additional research needs. *Community Guide* reviews of client-directed approaches appear elsewhere in this supplement.<sup>16,17</sup>

Although receiving a recommendation from a health-care provider is an important determinant of adherence to cancer screening,<sup>18–20</sup> providers miss screening opportunities during clinical encounters.<sup>18,20,21</sup> In this report, evidence of the effectiveness of two provider-directed approaches was reviewed: provider assessment and feedback, and provider incentives. Another approach, use of provider reminders, is being reviewed separately.<sup>16,17</sup>

## Methods

General methods for conducting *Community Guide* systematic reviews are described elsewhere.<sup>22–24</sup> Specific methods for reviews of interventions to increase breast, cervical, and colorectal cancer screening and for assessing economic efficiency are described in this supplement.<sup>25</sup> Consistent with other *Community Guide* reviews,<sup>16,17</sup> primary scientific investigations published through September 2004 were reviewed; these were identified and selected using the methods and criteria described.<sup>25</sup> Methodologic issues specific to the interventions discussed in this article are briefly discussed.

The conceptual model (Figure 1) shows hypothesized relationships between an intervention to increase cancer screening delivery or referral by providers, intermediate steps, and desired health outcomes. Completed screening (shaded) is the outcome of primary interest. Although an intermediate step in the causal pathway, completed screening provides the basis for evaluation of intervention effectiveness because links to the health outcome of ultimate interest—decreased mortality from breast, cervical, and colorectal cancers—have been established.<sup>4–6</sup> The goal of provider-directed interventions is to increase delivery of appropriate cancer screening services by providers. The systematic review development team<sup>15</sup> postulated that, by positively influencing provider attitudes or intentions about screening, these interventions can increase some combination of discussion of screening with clients, recommendation of screening tests to clients by providers, and ordering of screening tests. These activities would, in turn, lead to increased test completion and early detection, either directly or by influencing patient



**Figure 1.** Analytic framework used in reviews of provider assessment and feedback interventions to increase screening for breast, cervical, and colorectal cancers. (Oval indicates intervention, rectangles with rounded corners indicate mediators or intermediate outcomes, and clear rectangle indicates desired health outcomes.)

behavior, and ultimately to reduced cancer mortality. Interventions might cue or prompt providers to initiate discussions, recommend testing, or order tests. Interventions may also result in other benefits and harms, such as positive or negative effects on other health behaviors or use of health-care services.

Although recommending and ordering tests are critical to increasing screening rates, they do not assure client adherence or test completion. Therefore, studies with adequate study design and quality of execution, that reported only on screening tests recommended or ordered but not completed, are not included in the determination of intervention effectiveness in this review; they are, however, included to provide information about applicability, implementation, and other positive or negative effects.

Intervention effectiveness was evaluated by comparing post-intervention screening practices in study groups receiving the intervention with groups not receiving the intervention. Results of each study were represented as change in screening attributable to the intervention, using percentage point (absolute) change as the effect measure. According to *Community Guide* rules,<sup>23</sup> where evidence of intervention effectiveness was sufficient or strong, information about effectiveness, applicability, other effects, economic efficiency, barriers to implementation, and research gaps was summarized. Where evidence was insufficient to determine effectiveness, only remaining questions about effectiveness and other effects were summarized.

Effectiveness, applicability, and economic efficiency were determined by considering evidence across all three cancer sites combined, as long as evidence did not suggest differences in effectiveness by screening test. This decision was made because provider behavior was thought to be less influenced by barriers to screening in the client population or the nature of screening tests than was client behavior. Studies that assessed intervention effects for multiple screening tests could contribute more than one data point to aggregated estimates. Therefore, a sensitivity analysis was included; this repeated the examination of the effectiveness of these interventions by considering evidence for only one data point per study. Among studies originally contributing more than one data point, the criterion in selecting data points for use in the sensitivity analysis was to keep one data point each for mammography, Pap test, and FOBT. The data point to remain in this sensitivity analysis for each screening test was chosen randomly. Because few qualifying studies examined effectiveness of provider assessment and feedback interventions for colorectal cancer screening using tests other than FOBT, evidence for these tests is considered separately.

## Review of Evidence: Provider Assessment and Feedback

Provider assessment and feedback interventions both evaluate provider performance in delivering or offering screening to clients (assessment) and present providers with information about their performance in providing screening services (feedback). Feedback may describe the performance of a group of providers (e.g., mean performance for a practice) or an individual provider, and may be compared with a goal or standard.

## Effectiveness

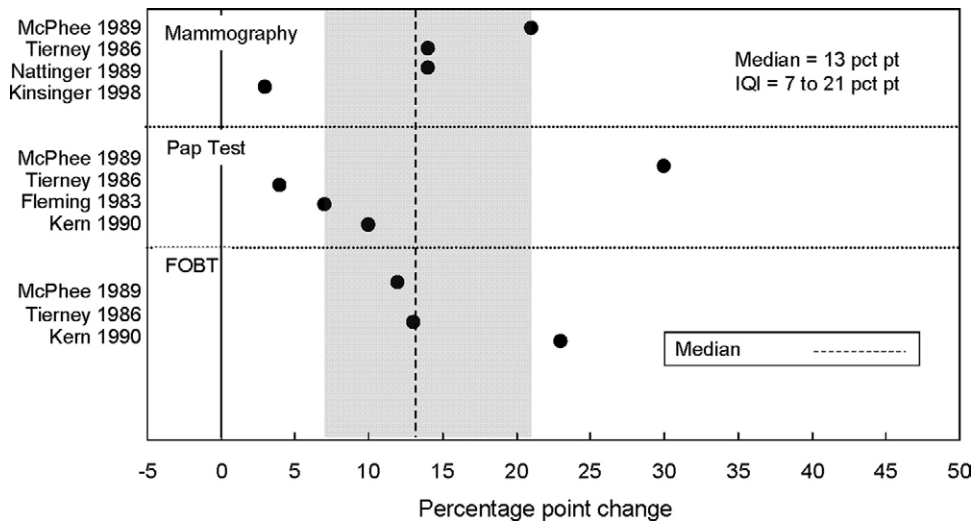
Ten studies were identified that reported using provider assessment and feedback to increase screening for breast, cervical, or colorectal cancers.<sup>26–35</sup> Eight studies<sup>26–28,30,31,33–35</sup> met criteria for inclusion in this review.<sup>25</sup> Of these eight studies, four were of greatest design suitability, one<sup>26</sup> with good and three<sup>27,30,31</sup> with fair quality of execution; one<sup>34</sup> was of moderate design suitability with fair quality of execution; and three were of least suitable design, one<sup>33</sup> with good and two<sup>28,35</sup> with fair quality of execution. Details of qualifying studies are available at [www.thecommunityguide.org/cancer](http://www.thecommunityguide.org/cancer).

Screening outcomes were ascertained through medical or administrative record reviews. Six studies<sup>26,28,30,31,33,35</sup> reported completed screening. Of these, two<sup>31,33</sup> also reported recommended or ordered screening. Two studies<sup>27,34</sup> reported only recommended or ordered screening. Assessment of provider performance in delivering, offering, or ordering screening was conducted by providers' audit of their own client records<sup>27,35</sup> or of client records for other providers,<sup>27,28,34</sup> by computer-generated record search,<sup>30,31</sup> or record audit by researchers.<sup>26,33</sup> Feedback was based on individual provider performance,<sup>28,30,34</sup> group performance,<sup>33</sup> or both,<sup>26,27,31,35</sup> and varied in frequency from a single feedback session<sup>27,33,35</sup> to monthly<sup>26,30,31</sup> sessions over a 5- to 7-month period or some other interval.<sup>28,34</sup>

Twelve effect estimates were available for completed screening outcomes: four for mammography,<sup>26,30,31,33</sup> four for Pap tests,<sup>26,28,30,35</sup> three for FOBT,<sup>26,28,30</sup> and one for flexible sigmoidoscopy.<sup>26</sup> All effects on mammography, Pap test, and FOBT completion were in the positive direction (Figure 2), with a 13 percentage point median increase across these tests (interquartile interval [IQI] = 7 to 21 percentage points). Mammography use increased 3 to 21 percentage points (median 14), Pap tests increased 4 to 30 percentage points (median 9), and FOBTs increased 12 to 23 percentage points (median 13). The single effect measure for flexible sigmoidoscopy indicated no substantial change. In one study the increase in cervical cancer screening was accompanied by a drop in the proportion of never-screened women.<sup>35</sup>

This sensitivity analysis included data on completed screening from six studies, with three data points for mammography,<sup>26,31,33</sup> two for PAP tests,<sup>30,35</sup> and one for FOBT.<sup>28</sup> The results were similar to those obtained using all of the available data across screening tests (median 11 percentage points; IQI = 4, 21).

The remaining seven effect measures assessed recommended or ordered screening tests. All effects were in the desired direction. The median increase across four outcomes based on mammography<sup>27,31,33,34</sup> and one



**Figure 2.** Percentage point change in completed screening by mammography, Pap test, and fecal occult blood test (FOBT), attributable to provider assessment and feedback interquartile interval (IQI).

each based on Pap tests,<sup>34</sup> FOBT,<sup>34</sup> and flexible sigmoidoscopy<sup>34</sup> was 24 percentage points (IQI= 10, 34). The range for mammography was 4 to 28 percentage points; increases for Pap tests, FOBTs, and flexible sigmoidoscopy were 38, 34, and 11 percentage points, respectively.

All interventions evaluated were directed at physicians. Nine of eleven effect measures for completed mammography,<sup>26,30,31</sup> Pap tests,<sup>26,28,30</sup> and FOBTs<sup>26,28,30</sup> were from interventions directed at internal medicine physicians-in-training, with a median increase of 14 percentage points (IQI= 12, 21). Interventions among nontrainee physicians resulted in a 3 percentage point increase in completed mammography<sup>33</sup> and a 7 percentage point increase in completed Pap tests.<sup>35</sup> Similarly, most (five) outcomes based on recommended or ordered mammography,<sup>27,31,34</sup> Pap tests,<sup>34</sup> and FOBTs<sup>34</sup> were from interventions among physicians-in-training and demonstrated a median 28 percentage point increase (range = 10–38). Recommended or ordered mammography increased by 4 percentage points in a single study of nontrainee physicians.<sup>33</sup>

### Applicability

The same body of evidence demonstrated increases in completed screening or in recommended or ordered screening in studies from the U.S.<sup>26,28,30,31,33</sup> and Great Britain,<sup>35</sup> and in urban,<sup>26–28,30</sup> rural,<sup>33</sup> and mixed urban/rural areas.<sup>34</sup> Assessment and feedback interventions produced positive effects in both trainee and nontrainee physician populations, although, based on limited data, trainees may be more responsive to this approach. No studies evaluated the effectiveness of these interventions for nonphysician providers. Two studies of completed screening specified client race and ethnicity<sup>26,31</sup> and included white, African-American, Hispanic, or Asian populations.

### Economic Efficiency

Two studies were found that allowed for calculation of cost effectiveness.<sup>27,36</sup> One study included sufficient data to calculate cost effectiveness of a provider assessment and feedback intervention to increase cancer screening adherence.<sup>36</sup> This study was classified as good, based on *Community Guide* criteria for quality assessment of economic data ([www.thecommunityguide.org/methods/econ-abs-form.pdf](http://www.thecommunityguide.org/methods/econ-abs-form.pdf)). The study evaluated the increase in screening over a 4-year period for seven different cancer screening tests, including FOBTs, digital rectal examinations, flexible sigmoidoscopy, Pap tests, pelvic exam, clinical breast exams, and mammography. Unlike the original study,<sup>26</sup> which separated out specific intervention effects for each screening test, this study determined only an overall effect measure from all screening tests. In calculating the cost per additional screening test, it was, therefore, necessary to assume that the type of test did not affect the cost of promoting one additional unit of screening. Based on this assumption, the study found that an audit with feedback intervention to physicians for the seven different screening tests would cost \$70.95 per additional screening.

The second study included sufficient data to calculate the cost effectiveness of a self-audit intervention among trainee physicians to increase orders for screening mammography.<sup>27</sup> The study was classified as good, based on *Community Guide* criteria. The cost per additional mammogram ordered was \$46.40. Depending on the percentage of ordered tests actually completed, the cost per completed test could be higher.

### Other Positive and Negative Effects

Several studies evaluated the effects of provider assessment and feedback on other services, and re-



ported increases in completed<sup>26,28</sup> and recommended or ordered clinical breast exams,<sup>34</sup> digital rectal examinations or office FOBT,<sup>26,28,34</sup> and breast self-examination instruction<sup>28</sup> (the last three are not USPSTF-recommended screening tests). Assessment and feedback have also resulted in increases in immunizations<sup>28,30,34,35</sup> and other noncancer screening services<sup>35</sup> when directly applied to these outcomes. Other studies found no substantial change in additional cancer-related or non-cancer-related services.<sup>27,33</sup> One study found no apparent “spillover” effect to services other than those assessed.<sup>27</sup>

### **Barriers to Implementation**

Reported barriers to implementing assessment and feedback interventions included potential burdens on practices or clinic staff to complete audits and prepare and provide feedback.<sup>26,28,35</sup> Others included the possible sensitivity of some providers to the source of evaluation. For example, in one study, physicians-in-training reportedly insisted that chart audits be performed by other physicians at the same training level.<sup>34</sup> Furthermore, the authors postulated that trained physicians may be sensitive to evaluation and criticism from other physicians or insurance companies.

### **Conclusions: Provider Assessment and Feedback**

According to *Community Guide* methods,<sup>23</sup> there is sufficient evidence that provider assessment and feedback interventions are effective in increasing screening for breast, cervical, and colorectal cancers by mammography, Pap test, and FOBT, respectively. This finding is likely applicable to populations and settings included in the studies, although further study is needed to determine if provider training status is related to the magnitude of effect. Evidence was insufficient, however, to determine the effectiveness of assessment and feedback in increasing colorectal cancer screening by methods other than FOBT, because too few qualifying studies were found, and the degree to which findings for other screening tests will generalize to these more invasive tests is not clear.

### **Directions for Future Research: Provider Assessment and Feedback**

The effectiveness of provider assessment and feedback in promoting screening mammography, Pap tests, and FOBTs has been established. However, several key research issues remain or are in need of further corroborative evidence. We encourage researchers to consider whether questions might be answered through studies underway or in development.

### **Effectiveness**

- Are these interventions effective in increasing screening by more invasive methods, such as colorectal endoscopy or double-contrast barium enema?
- Can a single assessment and feedback program targeting all three cancer sites increase screening use for each site?
- Are some approaches more effective than others (e.g., group versus individual feedback)?

### **Applicability**

- Does the magnitude of effect differ for (1) physicians-in-training versus trained physicians and (2) providers other than physicians?

### **Barriers to Implementation**

- What is required to facilitate dissemination and implementation of provider assessment and feedback to healthcare system settings across the U.S.?

### **Economic Efficiency**

- How are the costs and cost effectiveness of these interventions related to the structural characteristics of the settings of interventions? In particular, can HMOs address logistical problems (e.g., contacting providers and reducing administrative time) more readily than fee-for-service practices, thereby lowering costs and improving cost effectiveness?

### **Other Positive or Negative Effects**

- What is the impact of interventions on non-cancer-related healthcare delivery? For example, does the effect of these interventions spill over into improved delivery of other clinical services?

### **Review of Evidence: Provider Incentives**

Provider incentives are direct or indirect rewards that motivate providers to perform or make appropriate referral for cancer screening services. Rewards are usually monetary, but may also include nonmonetary incentives, such as continuing medical education credit. Because provider incentives implicitly depend on some form of assessment, an assessment component, with or without feedback, may be included in the intervention.

### **Effectiveness**

The search identified three studies<sup>37–39</sup> using provider incentives to increase screening for breast, cervical, or colorectal cancers. All three studies qualified for review and had fair quality of execution. Two<sup>37,38</sup> had greatest suitability of design and one<sup>39</sup> had least suitable.

Details of the three qualifying studies are available at [www.thecommunityguide.org/cancer](http://www.thecommunityguide.org/cancer).

Screening outcomes were ascertained by medical record audit<sup>37,39</sup> and self-report.<sup>37,38</sup> One study,<sup>39</sup> which linked reaching target population screening rates to general practitioner remuneration, reported an 8 percentage point increase ( $p < 0.05$ ) in completed cervical cancer screening within 6 months of increasing practitioner compensation for performing Pap tests. A second study<sup>37</sup> evaluated a \$50 incentive bonus, offered in the context of assessment with feedback and reminders, to physicians who referred at least 50% of eligible women for mammography. Because the intervention also included a provider reminder component, screening outcomes in this intervention group were compared with those of a group of general practitioners who received reminders only. After 1 year, recommended or ordered mammography in the intervention group exceeded that of the comparison group by only 1 percentage point, while mammography completion declined by 2 percentage points. The third study<sup>38</sup> evaluated a group bonus incentive for reaching pre-designated targets for recommending or ordering screening mammography, Pap tests, and FOBTs. The program was based on a formal semi-annual group assessment and feedback, with rewards given for group targets reached at each assessment period in the intervention group; the comparison group received no intervention. After 18 months, rates of recommending and/or ordering for mammography, Pap test, and FOBT had changed by -1.5, -0.8, and 2.2 percentage points, respectively.

Because intervention effectiveness was not established, the applicability of provider incentives was not addressed nor was a search for evidence made of economic efficiency or barriers to implementation.

### Other Positive or Negative Effects

No other positive or negative effects of provider incentives were identified in this review.

### Conclusions: Provider Incentives

According to *Community Guide* methods,<sup>23</sup> there is insufficient evidence to determine the effectiveness of provider incentives in increasing screening for breast, cervical, or colorectal cancers. Evidence is insufficient because of too few qualifying studies and inconsistent results.

### Directions for Future Research: Provider Incentives

The effectiveness of provider incentives in increasing colorectal, breast, and cervical cancer screening has not been established. Despite great interest in and use of provider incentives in many organized health systems (e.g., pay-for-performance models), relatively little pub-

lished scientific information is available to assess the effectiveness of incentives in increasing screening for breast, cervical, and colorectal cancers. Several research questions remain.

### Effectiveness

- Are provider incentives effective in increasing screening for colorectal, breast, and cervical cancers?
- Do provider incentives incrementally increase the effectiveness of provider assessment and feedback interventions?

### Economic Efficiency

- What are the most cost-effective approaches to reward cancer screening performance and/or referral by practitioners?

### Other Positive or Negative Effects

- Do these interventions result in other positive or negative changes in health behavior or use of health-care services?

### Discussion

These reviews present findings for two provider-directed interventions available to programs and planners seeking to improve delivery of cancer screening within healthcare settings. Based on these reviews, provider assessment and feedback interventions are effective in improving screening by mammography, Pap test, and FOBT. Findings were consistent across these three tests and produced substantial effect sizes. When applied to populations, this could translate into a large number of additional screening tests performed. The effect on provider recommendation or ordering of screening was generally larger than for completed tests, suggesting some barriers within systems or client non-adherence with recommendations. No harms and few barriers to intervention implementation were identified. However, administrative burden may be a concern for some, and questions remain about whether assessment and feedback interventions are equally effective outside of medical trainee practices.

Despite considerable interest in provider incentives, insufficient evidence was found to determine the effectiveness of incentives in increasing cancer screening rates, because of the small number of published studies available and the small effect sizes in these studies.

Findings that provider assessment and feedback interventions are effective are generally consistent with other reviews or meta-analyses of these interventions. In a review of cancer screening intervention studies, Zapka and colleagues concluded that audit and feed-

back improves screening rates.<sup>18</sup> Results are mixed for studies of the effects of assessment and feedback on other physician behaviors. Briss and colleagues completed a systematic review of selected interventions to improve vaccine coverage, and also concluded that provider assessment and feedback was effective.<sup>14</sup> In an overview of systematic reviews of interventions to improve quality of care, Grimshaw and others reported that reviews of audit and feedback interventions broadly reached the conclusion that these interventions have, at best, modest effects.<sup>40</sup> Similarly, in a Cochrane review of audit and feedback interventions on various healthcare outcomes, the authors concluded that audit and feedback can be useful, although effects are generally small to moderate.<sup>41</sup> They also concluded that the absolute effect of these interventions is likely to be larger when baseline adherence is low. There was no difference discerned in the magnitude of effect according to baseline cancer screening rates, although the number of studies was small. Unlike the findings of these other groups and ours, however, Stone and colleagues conducted a meta-analysis of controlled clinical trials assessing interventions to increase use of immunizations and cancer screening, and concluded that provider feedback consistently appeared relatively ineffective.<sup>42</sup> Whether variability among reviews in the magnitude of effect of assessment and feedback interventions is due to potential ceiling effects (achieving screening rates that are near optimal) in some studies is unknown.<sup>43</sup> Differences between this review and others may also reflect differences in inclusion criteria. For example, some reviews limited inclusion of previous reviews and studies to those examining cancer screening interventions within healthcare settings,<sup>18</sup> while others summarized reviews of various interventions targeting healthcare providers<sup>40</sup> and/or reporting varying measures of provider performance and/or patient outcomes.<sup>40,41</sup>

Additionally, these findings contribute information about effective methods for improving colorectal cancer screening rates,<sup>18,44</sup> which are considerably lower than rates of cervical or breast cancer screening.<sup>45</sup> As for other cancer screening tests, lack of a provider recommendation for screening is a barrier to colorectal cancer screening,<sup>19</sup> and the effectiveness of assessment and feedback on screening with FOBT may indicate a successful method to address this barrier. However, there is insufficient evidence to determine the effectiveness of provider assessment and feedback for colorectal cancer screening with endoscopy. Because colorectal cancer is a common cause of cancer-related morbidity and mortality, and because screening rates for colorectal cancer are low,<sup>45</sup> future study of these interventions is warranted.

Consistent with a previous review<sup>18</sup> and a meta-analysis of office-based interventions to increase cancer screening,<sup>43</sup> most studies involved trainee physicians. Positive

effects were found of provider assessment and feedback in all studies of both trainee and nontrainee physicians. One possible explanation for potential differences between trainee and nontrainee physicians is that trainee physicians may respond differently to feedback.<sup>30,31</sup> Further information is needed to discern if differences exist in magnitude of effect by training status.

The finding of insufficient evidence to determine effectiveness of provider incentives in increasing breast, cervical, or colorectal cancer screening highlights the need for more research on this intervention. Few studies have been done on use of provider incentives to increase cancer screening specifically, and other systematic reviews evaluating a broader range of outcomes have similarly reported a paucity of studies. An evidence report on *Economic Incentives for Preventive Care*, released by the Agency for Healthcare Research and Quality in 2004,<sup>46</sup> examined initiatives using explicit or extrinsic incentives—such as bonuses and cash or other in-kind financial incentives—for providers and consumers to engage in specific preventive care or health promotion practices. The report found little evidence that explicit provider financial incentives, particularly of the modest and artificial nature evaluated in the studies, are effective; in addition, the report found insufficient evidence to conclude that economic incentives are effective in promoting the long-term lifestyle changes required for health promotion. Furthermore, a systematic review conducted by the Cochrane Collaboration<sup>47</sup> “concluded that there was not a sufficient quality of evidence to obtain a definitive answer to the question as to whether target payment remuneration provides a method of improving primary health care.” The sparse existing literature about the use of provider incentives to increase preventive care services, specifically cancer screening, underscores the need for future research in this area.

As with all decisions regarding the implementation of new intervention strategies, consideration of the suitability of interventions for use in the local context is warranted. Where applicable, provider assessment and feedback interventions may reduce missed opportunities to promote screening during clinical encounters and may increase use of these three screening tests.

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