

Increasing Breast Cancer Screening: Multicomponent Interventions

Community Preventive Services Task Force
Finding and Rationale Statement
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CPSTF Finding and Rationale Statement

Intervention Definition

Multicomponent interventions to promote breast cancer screening combine two or more intervention approaches reviewed by the Community Preventive Services Task Force (CPSTF). Combinations may include the following.

- Two or more [intervention approaches from the following strategies](#):
 - Interventions to increase community demand: client reminders, client incentives, small media, mass media, group education, one-on-one education
 - Interventions to increase community access: reducing structural barriers, reducing client out-of-pocket costs
 - Interventions to increase provider delivery of screening services: provider assessment and feedback, provider incentives, provider reminders
- Two or more intervention approaches to reduce different structural barriers

Multicomponent interventions to increase cancer screening may be coordinated through healthcare systems, delivered in community settings, or both.

CPSTF Finding (August 2016)

The Community Preventive Services Task Force recommends multicomponent interventions to increase screening for breast cancer on the basis of strong evidence of effectiveness in increasing screening use.

Findings suggest greater effects result from interventions that combine approaches to increase community demand and access, and the greatest effects come from interventions that combine these two approaches with interventions to increase provider delivery of services. When designed for and implemented among underserved populations, multicomponent interventions can increase screening use in these populations. If access to appropriate follow-up care and treatment are provided, these interventions may improve health for these groups.

Rationale

Basis of Finding

The CPSTF recommendation is based on evidence from a systematic review of 88 studies (search period January 2004 - November 2013) that evaluated intervention effects on breast (33 studies), cervical (20 studies) or colorectal (56 studies) cancer screening use—services recommended by the U.S. Preventive Services Task Force (USPSTF 2016a, 2016b, 2012).

Compared with no intervention, multicomponent interventions increased breast cancer screening by a median of 6.2 percentage points (interquartile interval [IQI]: 0.9 to 14.5; 34 study arms).

Given that multicomponent interventions can include approaches within the strategies of increasing community demand, increasing community access, or increasing provider delivery of screening, many of these interventions are also multilevel interventions that address needs across the individual, provider, community, or system levels.

Multicomponent interventions vary in the number and type of approaches or strategies used. The review team conducted stratified analyses to understand the influence of these factors on cancer screening use. Studies across breast, cervical, and colorectal cancers were considered for these analyses.

The most commonly used intervention approaches were those that aimed to increase community demand for cancer screening. The largest screening increases were seen among multicomponent interventions that combined approaches from each of the three strategies (median increase of 24.2 percentage points [IQR: 8.8 to 39.0 percentage points]; 5 study arms) or that combined approaches to increase community demand and access (median increase of 11.2 percentage points [IQR: 5.3 to 18.2 percentage points]; 48 study arms).

Studies included in this review employed many different combinations of intervention approaches. Increases in screening use were seen across multicomponent interventions with different numbers of intervention approaches, though those with five or more intervention approaches showed a larger median increase. This was particularly true for multicomponent interventions aimed at increasing colorectal cancer screening.

Increases in cancer screening use were seen across multicomponent interventions, regardless of which individual approaches were used. One exception was multicomponent interventions that included provider assessment and feedback, which did not demonstrate an increase in screening across all three cancer types. Further examination revealed this finding was driven by two cervical cancer screening studies. For both breast and colorectal cancer screening, multicomponent interventions with provider assessment and feedback resulted in increases in screening use comparable to multicomponent interventions with other approaches.

When multicomponent interventions included approaches to reduce structural barriers, increases in screening were found for each type of structural barrier addressed, although none of the included studies provided child care. The largest increases in cancer screening rates were reported by when transportation barriers were addressed (median increase 18.4 percentage points, IQR: 8.5 to 30.2 percentage points; 11 studies) or language translation services were provided (62.7 percentage points, range 11.6 to 71.2 percentage points; 4 studies).

Most studies that provided information about incremental effects evaluated the addition of 1 or 2 intervention approaches to single component interventions. When an intervention approach to increase community demand was added to a single component intervention, cancer screening use increased by a median of 4.9 percentage points (IQR: 0.4 to 12.0 percentage points; 14 study arms). When an intervention approach to increase community access was added to a single component intervention, cancer screening use increased by a median of 17.1 percentage points (range: 4.6 to 18.7 percentage points; 2 study arms).

Applicability and Generalizability Issues

The CPSTF finding is considered applicable to a range of settings and populations within or outside the United States; in healthcare or community-based settings; and in urban or rural communities. Studies were conducted in the U.S. (29 studies), Canada (2 studies), Israel (1 study), and Singapore (1 study). Studies evaluated interventions implemented in community and healthcare settings, including community health centers and Federally Qualified Health Centers, and in urban and rural environments.

Multicomponent interventions were effective for populations with different baseline screening use, and in groups that were age-eligible for screening. Findings should also be applicable to different racial and ethnic groups. Many studies focused on one racial or ethnic group, and several studies provided within-study information about effects by race or

ethnicity. No studies included only American Indian/Alaska Native populations and few had samples that were majority Native Hawaiian/Pacific Islander.

Many of the studies did not report enough information to conclude whether most participants were low-income. Other studies, however, reported increases in cancer screening use among participants who were likely low-income or who had no, or inadequate, insurance. Findings, therefore, are likely applicable to these populations.

Findings should be applicable across intervention characteristics, including the number and type of intervention approaches included. Findings should also be applicable across types of intervention deliverers, including patient navigators, community health workers, and clinician educators.

Data Quality Issues

Study designs included randomized control trials (12 studies), non-randomized trials (5 studies), pre-post (13 studies), cohort (2 studies), and time series (1 study) designs. Stratified analyses found increases across different study designs, indicating robust findings.

Other Benefits and Harms

No additional benefits or harms were reported in included studies. One possible benefit of multicomponent interventions involving community health workers, however, is the potential for community health workers to address healthcare coverage.

Economic Evidence

A systematic search for economic evidence (search period January 2004–January 2018) identified 53 studies, 9 of which focused on breast cancer screening through mammography. Two studies focused on both breast and cervical cancer screening, and 2 studies focused on both breast and colorectal cancer screening. The majority of these studies were conducted in the United States with only 2 studies conducted in other high-income countries..

All monetary values are reported in 2016 U.S. dollars. Foreign currencies were converted to U.S. dollars using the Purchasing Power Parity Index from the World Bank (The World Bank, 2016). Cost and cost-effectiveness estimates were adjusted for inflation using the Consumer Price Index (U.S. Bureau of Labor Statistics, 2016).

Across all 14 breast cancer studies, the median intervention cost per participant was \$26.69 (IQI: \$3.25 to \$113.72; 17 study arms). The median cost per participant was \$1.49 (IQI: \$0.95 to \$12.22; 5 study arms) for interventions that increased community demand, and \$44.83 (IQI: \$4.90 to \$133.37; 11 study arms) for interventions that increased community demand and access.

Across all studies, the median incremental cost per additional woman screened was \$147.64 (IQI: \$32.92 to \$924.98; 10 study arms). The mean incremental cost per additional woman screened for studies focused on increasing community demand was \$567.82 (2 study arms). The median incremental cost per additional woman screened for studies focused on increasing both community demand and community access was \$147.64 (IQI: \$33.54 to \$528.17; 8 study arms). There was no consistent relationship between the baseline-screening rate (median: 53%; IQI: 32% to 69%; 6 estimates) and the incremental cost per additional woman screened.

There were no studies that reported incremental cost per quality-adjusted life year (QALY) gained. Therefore, a cost-effectiveness determination could not be made for multicomponent interventions to increase breast cancer screening.

Considerations for Implementation

Included studies of multicomponent interventions to increase breast, cervical, and colorectal cancer screening evaluated a large number of interventions with a heterogeneous mix of components. Decision makers should consider the local population, needs, and context when selecting interventions to implement. Cost and resource requirements may also be considerations when implementing multicomponent interventions, particularly for intensive or large-scale interventions.

Evidence suggests that it is important to address needs related both to community demand for, and access to, screening services, and that multicomponent interventions are most effective when they address both of these needs and provider delivery.

The large effect estimate for interventions that included language translation services for non-English speaking study participants was based on 4 studies. All 4 of the studies included predominantly Asian American populations, and three of them evaluated similar interventions. In addition to these 4 studies, a number of included studies involved language translation activities, including translation of intervention components (e.g., education). These studies also showed an increase in screening use, although smaller in magnitude. Interventions that addressed transportation barriers also resulted in large increases in screening use. Most of the studies that addressed transportation or language needs recruited majority low-income study participants, suggesting that these may be effective intervention approaches for low-income groups.

People with low incomes or lacking insurance are less likely to be up-to-date with cancer screening (Sabatino et al., 2015; Brown et al., 2014). Targeting multicomponent interventions to these populations can increase their screening use. It is important, however, to ensure access to timely and appropriate follow-up and treatment for all populations. Lack of available and financially accessible, appropriate follow-up care could lead to missed opportunities to improve health and potentially reduce the benefits of screening.

Many interventions in this review were targeted to population subgroups. For interventions targeted to specific populations, appropriateness of materials is important (Slater et al., 2005). Technology infrastructure may be a consideration for some intervention approaches. Technology may increase efficiency and reduce maintenance costs (Flight et al., 2012; Mosen et al., 2010), but it also may require upfront costs and resources (Taplin et al., 2008; Leffler et al., 2011). In addition, some groups may not have equal access to or use of these technologies (Flight et al., 2012).

Evidence Gaps

Several areas were identified as having limited information. Additional research would help answer remaining questions or strengthen findings in these areas.

- What are intervention effects on repeat cancer screening rates?
- How effective are interventions that only include strategies to increase community access and provider delivery?
- What is the magnitude of effect for multicomponent interventions that provide language translation services, and does it vary across population subgroups?
- What are effects of specific combinations of intervention approaches?
- How well do interventions work among people who have low health literacy?
- How do intervention costs compare with intervention benefits?

More consistent terminology and reporting of study details would improve future assessments of intervention effectiveness. For example, more detailed reporting about intervention activities, barriers addressed, study participants

(including income and health insurance status), and those delivering interventions would improve understanding and characterization of intervention approaches and intervention effectiveness in different populations.

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Disclaimer

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