

COLORECTAL CANCER (Screening)

Why This Chapter is Important for Employers: An Overview

- Colorectal cancer is the second leading cause of cancer death.¹
- Routine screening can reduce the number of people who die of colorectal cancer. While estimates of mortality reduction due to screening vary by type of screening test, the range is approximately 15% to 60%.²⁻³
- The estimated annual national expenditure for colorectal cancer treatment is \$5.5-\$6.5 billion; inpatient hospital care accounts for 80% of this cost.⁴
- Because colorectal cancer is a disease of middle and old age, the costs related to colorectal cancer treatment are likely to increase as the population ages. For example, hospital admissions for colorectal cancer are expected to double by 2050.⁴
- Screening can prevent colorectal cancer by allowing clinicians to identify and remove precancerous polyps before they develop into cancer. Screening can also identify cancer early in the course of the disease when treatment is more effective and the chance of recovery is high.²⁻⁵
- The cost of screening is typically less than the cost of treating cancer. When screening identifies a colorectal tumor in its early stages, the cost of treatment is often much less expensive than if the tumor is detected later in the course of disease.⁴

Clinical Preventive Service Recommendations

U.S. Preventive Services Task Force Recommendation

The USPSTF strongly recommends that clinicians screen men and women 50 years of age or older for colorectal cancer.²

Evidence Rating: A (Strongly Recommended/ Good Evidence)

The USPSTF found fair to good evidence that several screening methods are effective in reducing mortality from colorectal cancer. The USPSTF concluded that the benefits from screening substantially outweigh potential harms, but the quality of evidence, magnitude of benefit, and potential harms vary with each method.²

Information Sources

The recommendations and supporting information contained in this document came from several sources, including the:

- Agency for Healthcare Research and Quality (AHRQ)
- American Cancer Society (ACS)
- International Agency for Research on Cancer (IARC)
- National Academy of Sciences (NAS)
- Peer-reviewed research

The background and supporting information contained in this document is a compilation of research findings. All information presented in this document should be attributed to its referenced source and should not be considered a reflection of other organizations cited in the text.

Condition/Disease Specific Information

Epidemiology of Condition/Disease

Colorectal cancer is the second leading cause of cancer death in the United States. It is also a major cause of premature mortality; patients who die of colorectal cancer lose 13 years of life, on average.¹ The American Cancer Society (ACS) estimated that there would be 104,950 colon and 40,340 rectal cancer cases in the United States in 2005. Although mortality rates have continued to decline over the past 15 years, an estimated 56,290 deaths from colorectal cancer were predicted to occur in 2005, comprising about 10% of all cancer deaths.¹

Condition/Disease Risk Factors

Risk factors for colorectal cancer include being male, being older, having a family history of colorectal cancer, having a personal history of inflammatory bowel disease, being overweight or obese, being physically inactive, having certain genetic conditions³, and (possibly) consuming inadequate amounts of fruits and vegetables.⁶

Value of Prevention

Economic Burden of Condition/Disease

The annual expenditure for colorectal cancer was conservatively estimated to equal \$5.3 billion in 2000.⁵ However, other investigators estimated that inpatient costs alone exceeded \$5 billion in 1994 and their analysis also indicated that colon cancer-related admissions were twice as long and twice as expensive as the average hospital admission in the United States.⁴

Because colorectal cancer is a disease of middle and old age, the costs related to colorectal cancer treatment are likely to increase as the population ages. Based on census projections, the annual number of colon cancer-related hospital admissions among persons aged 50 years is expected to increase from 215,000 in 1992 to 471,000 in 2050. Similarly, among persons aged 60 years and older hospital admissions for colorectal cancer are expected to increase from 192,000 in 1992 to 448,000 in 2050.⁴

Workplace Burden of Condition/Disease

Besides the health, disability, and life insurance costs for employees affected by colorectal cancer, lost productivity associated with morbidity and premature mortality contributes to significant additional costs. During 1998, colorectal patients were hospitalized for 2.3 million days — a work loss equivalent of \$70.9 million in lost wages among the working-age population. This figure would increase to \$106.1 million if time away from work due to care in all settings was considered.⁵

Economic Benefit of Preventive Intervention

Screening can prevent colorectal cancer by allowing clinicians to identify and remove precancerous polyps before they develop into cancer. Screening can also identify cancer early in the course of the disease when treatment is more effective and the chance of recovery is high. The cost of screening is typically less than the cost of treating cancer and, when screening identifies a colorectal tumor in its early stages, the cost of treatment is often much less expensive. For example, one study, which looked at the cancer care costs among members of a health maintenance organization (HMO), found that the net costs of initial care for colon cancer were \$7,002 at the carcinoma in situ stage and \$11,624 at the local stage compared to \$13,367 at the regional stage, and \$15,276 at the distant stage (all figures in year 1992 dollars).⁷

Estimated Cost of Preventive Intervention

The average cost of colorectal cancer screening varies by location and provider. The 5 recommended methods of screening for colorectal cancer have very different initial costs, with FOBT and colonoscopy being the least and most expensive methods respectively. However, because they are typically used at different time intervals and because colonoscopy is required to confirm results of the other methods, the 10-year overall cost for screening methods that include diagnostic colonoscopy are similar. Table 1 lists the average price of colorectal cancer screening, by type. Cost estimates are based on 2004 data from privately-insured beneficiaries.⁸

Table 1: Average Private-Sector Cost of Colorectal Cancer Screening Methods (in year 2004 dollars)⁸

Screening Technique	Average Price per Procedure	Recommended Number of Over a 10-Year Period	Average Price Over a 10-year Interval
Colonoscopy	\$557 (range \$150 to \$1,112)*	1	\$557 (range \$150 to \$1,112)*
Flexible sigmoidoscopy; requires a follow-up colonoscopy if polyps are found	\$174 (range \$54 to \$392)*	2	\$348 (range \$108 to \$784)*
Double-contrast barium enema; may require follow-up colonoscopy	\$126 (range \$38 to \$399)*	2	\$252 (range \$76 to \$798)*
Fecal occult blood test (FOBT); may require follow-up colonoscopy	\$7 (range \$2 to \$16)*	10	\$70 (range \$20 to \$160)*
Combination of flexible sigmoidoscopy and FOBT	\$181 (range \$56 to \$408)*	2/10	\$418 (range \$128 to \$944)*

Source: Thompson Medstat. Marketscan. 2004.*Approximately 95% of paid claims fell within the stated range.

Estimated Cost of Treatment

Not Provided

Cost-Effectiveness and/or Cost-Benefit Analysis of Preventive Intervention

A systematic review of cost-effectiveness analyses for different colorectal cancer screening methods found that most common screening strategies for adults aged 50 years or more would result in an average cost-effectiveness ratio ranging from \$10,000 to \$30,000 per life-year saved (year 2000 dollars) compared to no screening.⁹ In comparison to other preventive interventions and to commonly accepted cost-effectiveness benchmarks, screening for colorectal cancer is cost-effective.

Preventive Intervention Information

Preventive Intervention: Purpose of Screening

The purpose of screening for colorectal cancer is to find precancerous polyps so that they can be removed before they turn cancerous, thus preventing the development of a tumor. Screening can also identify cancer early in the course of the disease when treatment is more effective and the chance of recovery is high.

Unfortunately, screening rates for colorectal cancer are low; fewer than half of men and women over age 50 are screened at the recommended intervals.¹⁰

Benefits and Risks of Intervention

The benefits of screening are substantial. Routine screening can reduce the number of people who die of colorectal cancer by preventing cancer or identifying it in its earliest stages when treatment is most effective. While estimates of mortality reduction due to screening vary by type of screening test, the range is approximately 15% to 60%.²

The risks associated with screening depend on the type of screening method used. All of the recommended tests can produce false-positive results, which may lead to unnecessary procedures with resultant harms. Flexible sigmoidoscopy, colonoscopy, and double-contrast barium enema may cause perforation and bleeding. However, the benefits of colorectal cancer prevention and early detection outweigh the risks of every screening method.²

Initiation, Cessation, and Interval of Screening

Screening for colorectal cancer should be initiated at age 50 for both men and women. For individuals who are determined by their physicians to be at higher risk of the disease, screening may be initiated at an earlier age.¹¹ Screening has been found to be effective for people up to age 80. However, randomized trials suggest that life expectancy of at least 5 years may be required to realize the benefits of screening, so the risks and costs of screening may outweigh the benefits for people with reduced life expectancy because of age or illness.⁵

The optimal interval between screenings depends on the screening method used and is illustrated in Table 2.

Table 2: Colorectal Cancer Screening Methods and Recommended Intervals⁵

Screening Method	Recommended Interval
Colonoscopy	10 years
Flexible sigmoidoscopy	5 years
Double-contrast barium enema	5 years
Fecal occult blood tests (FOBT)	1 year
Combination of flexible sigmoidoscopy and FOBT	5 years for the flexible sigmoidoscopy and one year for the FOBT

Intervention Process

Approved methods of screening for colorectal cancer include colonoscopy, flexible sigmoidoscopy, fecal occult blood testing (FOBT), and double-contrast barium enema. FOBT may be combined with flexible sigmoidoscopy to improve the sensitivity of the tests. The approved FOBT test uses specimens collected in the patient's home.²⁻³

Treatment Information

Health benefits should include provisions for diagnostic and treatment services.

Strength of Evidence for the Clinical Preventive Service

The level of evidence supporting the recommendations contained in this chapter is described below.

Evidence-Based Research:

U.S. Preventive Services Task Force (USPSTF)

Strength of Evidence: A (Strongly Recommended/Good Evidence)

- The USPSTF found fair to good evidence that several screening methods are effective in reducing mortality from colorectal cancer. The USPSTF concluded that the benefits from screening substantially outweigh potential harms, but the quality of evidence, magnitude of benefit, and potential harms vary with each method.²

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References:

1. American Cancer Society. Cancer Facts & Figures 2005. Atlanta, GA: American Cancer Society; 2005.
2. U.S. Preventive Services Task Force. Screening for colorectal cancer. Summary of recommendations. Rockville, MD: Agency for Healthcare Research and Quality; 2002; [cited 2006 Sep 15]. Available from: <http://www.ahrq.gov/clinic/uspstf/uspscolo.htm>.
3. U.S. Preventive Services Task Force. Colorectal cancer screening. Summary, evidence report: Number 1. AHCPR Publication No. 97-0302. Rockville, MD: Agency for Health Care Research and Quality; 1998.
4. Seifeldin R, Hantsch JJ. The economic burden associated with colon cancer in the United States. *Clinical Therapeutics*. 1999; 21(8): 1370-1379.
5. The American Gastroenterological Association. The Burden of Gastrointestinal Diseases. Bethesda, MD: American Gastroenterological Association; 2001. Available from: <http://www.gastro.org/user-assets/Documents/burden-report.pdf>.
6. International Agency for Research on Cancer. Weight control and physical activity. IARC handbooks of cancer prevention, vol. 6. Lyon (France): IARC Press; 2002.
7. Taplin SH, Barlow W, Urban N, Mandelson MT, Timlin DJ, Ichikawa L, et al. Stage, Age, Comorbidity, and Direct Costs of Colon, Prostate, and Breast cancer Care. *Journal of the National Cancer Institute* 1995;87(6):417-426.

8. Thomson Medstat. Marketscan. 2004.
9. Pignone M, Saha S, Heorgem T, Mandelblatt J. Cost-effectiveness analyses of colorectal cancer screening: a systematic review. *Ann Internal Med* 2002;137:96-104.
10. Seeff LC, Nadel MR, Klabunde CN, Thompson T, Shapiro JA, Vernon SW, et al. Patterns and predictors of colorectal cancer test use in the adult U.S. population. *Cancer* 2004;100: 2093-103.
11. Berg AO, Atkins D. Screening for colorectal cancer: recommendations and rationale. Rockville, MD: Agency for Health Care Research and Quality; 2002.
12. Pignone M, Saha S, Heorgem T, Mandelblatt J. Cost-effectiveness analyses of colorectal cancer screening: a systematic review. *Ann Internal Med* 2002;137:96-104.