

A Study of Colorectal Cancer Screening in Pennsylvania

Ronald E. Myers, PhD
Professor of Medicine
Department of Medical Oncology

Mona Sarfaty, MD
Research Assistant Professor
Department of Health Policy

Thomas Jefferson University

In January 2006, Senate Resolution 212 directed the Pennsylvania Legislative Budget and Finance Committee: A Joint Committee of the Pennsylvania General Assembly to conduct a study of various aspects of colorectal screening. Researchers at Thomas Jefferson University were funded to determine the state's colorectal cancer burden, describe screening options and their cost-effectiveness, determine insurance coverage for screening, and assess screening capacity. The research team completed this policy study using data collected through reviews of the scientific literature, contact with leading experts in the field, administration of three statewide surveys, collection of data from the Pennsylvania Department of Health, and the Pennsylvania Health Care Cost Containment Council. Findings are summarized below.

Colorectal Cancer Burden and Risk

The burden of colorectal cancer (CRC) is substantial in the Commonwealth of Pennsylvania. The state will experience an estimated 8,000 new cases and 2,970 deaths from this disease in 2006.¹ Pennsylvania colorectal cancer incidence and mortality rates are higher than those expected in the nation. Further, incidence and mortality rates vary considerably across the state. The lifetime risk for being diagnosed with colorectal cancer in the general population is approximately 6%. More than 90% of colorectal cancer cases are diagnosed in persons 50 years of age or older. The risk for being diagnosed with colorectal cancer is greater among individuals with a personal or family history of colorectal cancer and or colorectal polyps, a personal history of inflammatory bowel disease and certain inherited genetic characteristics, e.g., familial adenomatous polyposis (FAP) and hereditary nonpolyposis colorectal cancer (HNPCC).²

Screening and Cost-Effectiveness

Screening for colorectal cancer in the absence of symptoms offers the potential for both primary prevention (incidence reduction) by removing pre-cancerous polyps and secondary prevention (mortality reduction) by detecting and treating the disease at an early stage. The recommended screening modalities are stool blood testing (SBT) every year, flexible sigmoidoscopy every five years, annual SBT plus flexible sigmoidoscopy every five years, colonoscopy every 10 years, or double contrast barium enema every five years. Screening with colonoscopy is recommended for those at increased risk at age 40, or 10 years before the age at which a member of the person's family was diagnosed with colorectal cancer.³

The standard threshold in economic outcomes research holds that an average cost-effectiveness ratio (ACER) of less than \$50,000 signals a relatively worthwhile economic investment. An ACER compares the total cost of screening to the total number of life years saved. ACERs for the most cost-effective screening strategies are as follows: ACER for stool blood testing every year ranges from \$5,980 to \$11,632; ACER for combined annual stool blood testing and flexible sigmoidoscopy every five years ranges from \$13,922 to \$24,570; ACER for colonoscopy every ten years ranges from \$14,181 to \$23,570.⁴ Thus, the use of colorectal cancer screening by recommended means is more cost-effective than not screening. Further, an annual SBT is the most cost-effective screening approach, followed by a combination of SBT and flexible sigmoidoscopy. Colonoscopy is less cost-effective than the other two alternatives, although it is certainly objectively cost-effective by the standards of economic outcomes research.

Insurance Coverage for Screening

Insurance coverage for colorectal cancer screening is not uniform in Pennsylvania. The majority of insurers reported “always” covering the recommended colorectal cancer screening tests. The remaining insurers, however, reported that the screening tests were covered “sometimes.” A small number of insurers restricted coverage for colonoscopy screening to enrollees who are at increased risk. Deductibles and co-payment varied considerably by type of screening test.⁵

Colorectal Cancer Treatment Costs

In 2005, there were 9,287 hospital admissions in Pennsylvania for which colorectal cancer was the **primary** diagnosis. Admissions by disease stage were as follows: Stage 1 (1%), Stage 2 (54%), Stage 3 and expired (45%). Treatment costs related to these admissions totaled \$540,533,844. Average treatment costs increased in accordance with disease stage: Stage 1 (\$36,395), Stage 2 (\$54,938), Stage 3 and expired (\$62,845). In 2005, there were also 5,327 hospital admissions in Pennsylvania for which colorectal cancer was a **secondary** diagnosis. Admissions by disease stage were as follows: Stage 1 and reported history of colorectal cancer (1%), Stage 2 (57%), Stage 3 and expired (42%). Treatment charges related to these admissions totaled \$222,256,770. Average treatment charges increased in accordance with disease stage: Stage 1 and reported history of CRC (\$28,400), Stage 2 (\$40,248), and Stage 3 and expired (\$43,944). Overall, there were a total of 14,614 hospital admissions for which colorectal cancer was the primary or secondary diagnosis. Treatment charges increased in accordance with disease stage. Total charges related to these admissions were \$762,790,614.⁵

Capacity and Demand for Colorectal Cancer Screening

A statewide survey of hospitals and ambulatory surgery centers showed that there is excess capacity in the state for the performance of colonoscopy procedures. Analysis of the survey data also indicates that flexible sigmoidoscopy screening is not commonly recommended or performed but there is substantial excess capacity for the performance of this procedure. Stool blood testing is relatively inexpensive and widely available. Screening capacity does not present a problem. Using three scenarios, we estimate that if the demand for all colorectal cancer screening procedures increased by 2.5%, 5%, or 10% per year, there would still be no capacity problem.⁵

Conclusions

Primary care physicians serve a basic role in facilitating population use of recommended colorectal cancer screening tests and follow up of abnormal screening test findings. Physicians most commonly recommend stool blood tests and colonoscopy screening. Hospitals and ambulatory surgery centers routinely provide flexible sigmoidoscopy and colonoscopy screening. It appears that sigmoidoscopy is currently used infrequently for colorectal cancer screening purposes in Pennsylvania. The capacity for endoscopy (flexible sigmoidoscopy and colonoscopy) screening in the state is substantial, however, and should accommodate increased demand without placing a strain on institutions that provide these procedures.

Any increase in demand for colorectal cancer screening resulting from these efforts is not expected to have a significant impact on the pricing structure or safety profile of colonoscopy or other screening procedures. Increases in screening rates can be expected to reduce both the incidence and mortality from colorectal cancer. Higher levels of screening use would be expected to reduce the costs of medical care for colorectal cancer. Increased colorectal cancer screening use could substantially reduce the personal and economic burden of colorectal cancer for citizens of the Commonwealth.

References

1. Pennsylvania Department of Health, Bureau of Health Statistics and Research. Cancer Facts and Figures, Pennsylvania 2005. Harrisburg, PA: Pennsylvania Department of Health, 2005:14-16.
2. Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Feuer EJ, Edwards BK, eds. SEER Cancer Statistics Review, 1975-2002, National Cancer Institute. Bethesda, MD. Available at http://seer.cancer.gov/csr/1975_2002/. Accessed April 10, 2007.
3. American Cancer Society. Cancer Facts & Figures 2006. Available at: <http://www.cancer.org/downloads/STT/CAFF2006PWSecured.pdf>. Accessed on April 10, 2007
4. Pignone M, Russell L, Wagner J, eds. *Economic Models of Colorectal Cancer Screening in Average-Risk Adults: Workshop Summary*. Washington, DC: The National Academies Press, 2005.
5. Myers RE, Sarfaty M. Various Aspects of Colorectal Cancer Screening. Legislative Budget and Finance Committee: A Joint Committee of the Pennsylvania General Assembly. January 2007.