Colorectal carcinoma represents the fourth most common cancer and the second most common cause of cancer death in the United States. Approximately 150,000 new cases and 56,000 deaths are predicted for 1997. Evidence exists that a reduction in mortality from colorectal carcinoma is feasible through early detection and removal of polyps. Guidelines for screening and surveillance have been established by a number of societies in hopes of providing a cost-effective means of realizing this goal.

Several approaches are available for the detection of colorectal neoplasia, including physical examination, digital rectal examination, fecal occult blood testing (FOBT), serum carcinoembryonic antigen (CEA), standard sigmoidoscopy, fiber-optic sigmoidoscopy, full colonoscopy, single- and double-contrast barium enema, and combinations of these procedures.

Generally, screening for colorectal carcinoma is performed to prevent the development of cancer and to recognize and remove any premalignant lesions. Screening is justified when the disease is common and associated with significant morbidity and mortality, when the screening examinations are accurate enough to detect early forms of the disease in a manner that is acceptable to the patient, when the examinations can be performed in clinical practice, when detection leads to treatment that will improve prognosis, and when the potential benefits of screening outweigh the potential morbidity and costs. Evidence from various trials supports that screening for colorectal carcinoma meets these criteria. The problem at present is that at the very best, less than 40% of the US population has had any form of screening.

Generally, screening tests are evaluated in terms of performance, effectiveness, screening frequency, complications, and acceptability. Frequency of testing is usually determined by scientific evidence but also may be controlled by factors such as cost and risk. Effectiveness basically describes how well a test works in routine practice. Performance, simply stated, evaluates how well the test can differentiate between those likely to be positive and those less likely to be negative. For colorectal neoplasia, this means the presence or absence of polyps.

For the purposes of colorectal neoplasia, screening must be distinguished from surveillance. Screening identifies those patients who are more likely to have polyps or cancer from among the asymptomatic population. Surveillance monitors those with a history of colorectal neoplasia or those with other higher risk conditions such as inflammatory bowel disease. Finally, diagnosis involves confirmation of the presence of neoplasia after a positive screening test. Obviously, some tests or procedures may function as both tools of screening and diagnosis (ie, colonoscopy).

General guidelines are as follows: Screening should be offered to all beginning at 50 years of age. Personal and family risk factors need to be considered. Symptomatic patients require diagnostic evaluation and are not candidates for screening. Diagnostic evaluation should be performed for a positive screening examination. Screening should be readily available, and participation should be encouraged. Patients should be given adequate information regarding risks and benefits. Screening tests should be performed correctly with acceptable proficiency. Follow-up surveillance should be considered for those who have been treated previously for neoplasia or who have another underlying premalignant condition such as inflammatory bowel disease.

The average-risk patient after 50 years of age should be offered annual FOBT and flexible sigmoidoscopy every three to five years. An alternative would be colonoscopy every 10 years or double-contrast barium enema every five to 10 years combined with proctoscopy. All positive studies should be followed by complete colonoscopy. After a positive diagnostic evaluation (ie, colonoscopy), patients are placed under surveillance.

Various categories of higher-risk patients require changes to the proposed screening procedures. Those with first-degree relatives with a history of colorectal neoplasia should undergo the above-mentioned screening options beginning at age 40 instead of 50. Those with a family history of familial polyposis should undergo annual flexible sigmoidoscopy beginning at puberty, as well as genetic counseling and possibly genetic testing. Patients with a family history of hereditary nonpolyposis colon cancer should be offered a full colonoscopy every one to two years beginning at the age of 20 and annually after the age of 40. Again, genetic counseling and testing should be considered. People with a history of adenomatous polyps should have a full colonoscopy at three years from the initial examination. Those with a negative result should undergo subsequent examinations every five years. Those with a history of colorectal carcinoma should undergo a complete colonoscopy one year following resection. If this is negative, follow-up examination may be in three years and then every five years if normal. Finally, those with inflammatory bowel disease of long duration should undergo annual colonoscopy in search of dysplasia or cancer.

All screening strategies are more effective at preventing death from colorectal carcinoma. Much of the risk of screening is related to the eventual colonoscopy required for a positive study, which is generally seen prior to any benefit obtained from screening. The costs of screening reflect not only the cost of the actual screening, but also the costs of the diagnostic and surveillance tools it generates and the costs of any complications incurred. All colorectal screening strategies are within the range of acceptable cost-effectiveness by US health standards (less than $20,000 per year of life saved).

In conclusion, widespread adoption of screening recommendations for colorectal carcinoma could save up to 30,000 lives annually and reduce the mortality by over 50%.

Selected References