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Colorectal cancer screening

Sidney J. Winawer* MD

Paul Sherlock Chair in Medicine, Attending Physician, Professor of Medicine
Gastroenterology and Nutrition Service, Memorial Sloan-Kettering Cancer Center,
Weill Medical College of Cornell University, 1275 York Avenue, Box 90, New York, NY 10021, USA

Colorectal cancer is a worldwide problem having global increases in the number of cases and deaths because of the expanding and aging of the population in both developing and developed countries. Screening methods are available which can reduce the incidence by removal of adenomas and can reduce deaths in diagnosed cancer cases by earlier stage detection. Faecal occult blood testing has the strongest proof of effectiveness based on randomised control trials; sigmoidoscopy has lesser proof based on case control studies, and barium enema the weakest proof of effectiveness. Screening colonoscopy has not been subjected to a randomised trial but there is now considerable evidence of its performance and safety and it has the ability to screen, diagnose, and treat (polypectomy) in one test and it is becoming increasingly offered. Many guidelines are now in place, all with positive a position on the effectiveness of screening. However, screening rates are low and many barriers are present that need to be overcome in order to make a major global impact on colorectal cancer incidence and mortality.

Key words: colorectal cancer; polyps; screening; adenomas; colonoscopy; occult blood; sigmoidoscopy; barium enema; CTC; stool DNA.

INTRODUCTION

Colorectal cancer (CRC) is a worldwide problem with an annual incidence of approximately 1 million cases and an annual mortality of more than 500,000.[1] The absolute number of cases will increase over the next 2 decades as a result of aging and expansion of populations in both developed and developing countries. The risk for this cancer varies from country to country and even within countries. The risk also varies among individual people based on diet, lifestyle, and hereditary factors. We have learned much about these factors in recent years and can risk-stratify people based on many of them. We have also learned much about how most colorectal cancers develop from both a pathological and somatic genetic perspective.[2,3] The long time frame

* Corresponding author.
E-mail address: winawers@mskcc.org

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for the progression of the vast majority of precancerous adenomas to cancer provides an opportunity not only to screen people for early stage curable cancer, but to find and remove adenomas and prevent cancer altogether. The most common neoplastic outcome of colorectal cancer screening is the adenoma.[4,5] After removal, patients need to be placed in a follow-up surveillance program, as do the patients with identified and treated cancer. Screening needs to be applied within the framework of a program that includes: primary prevention (diet, lifestyle), timely diagnostic workup with colonoscopy in those screened positive, and timely treatment (polypectomy, surgery). This review is not directed to surveillance: the monitoring of people who have premalignant conditions (IBD) or who have been treated for adenomatous polyps or cancer.[6]

Colorectal cancer screening is particularly challenging as reflected in current low screening rates in most countries at high risk for colorectal cancer. Colorectal cancer screening is complex because there are multiple options, it requires considerable patient effort (FOBT slides, colonoscopy preparation, etc.), and utilises sedation and a health care partner for some tests (colonoscopy). For a screening program to be successful multiple events must occur, beginning with the primary care physician awareness and recommendation, patient acceptance, financial coverage, risk stratification, screening test, timely diagnosis, timely treatment, and appropriate follow-up. If any one step is faulty or is not high quality the screening will fail (Table 1).[7]

If a screening program is successful using present options, its cost-effectiveness will reduce mortality from colorectal cancer and will reduce the incidence of colorectal cancer by removal of adenomas. The relative impact of each screening option differs and the evidence is presented. New tests can be considered as options with evidence that performance is equal to or better than a present test. Long term mortality data is generally not needed for each new test. An exception to this may be widely recommended and utilised tests that are also invasive such as screening colonoscopy. The magnitude of the risk/benefit ratio compared to other tests such as FOBT and Flexible Sigmoidoscopy should be determined. Colonoscopy is potentially so beneficial, that strong evidence of its long term effect on mortality and incidence is critical to its wide application where available.

In the future newer tests may add additional options or replace current tests. Some of the technology already being tested include wireless capsule endoscopy for the colon, self-propelling colonoscopes and computer assisted colonoscopes. Improvement and innovations in present colonoscopes may improve detection rates of small or flat adenomas and help select those polyps that need polypectomy (Narrow Band Imaging, high magnification, DNA probes, etc.…).

Finally, it must be emphasised that the ultimate responsibility for patient care rests with the physician's judgment. This is based on skill, knowledge, experience patient interaction, and many other factors. Whether to screen a particular patient and which test options to use, how to treat and follow-up are individual decisions.

Table 1. Definitions.

Colorectal cancer screening	The testing of asymptomatic individuals to determine who are likely to have adenomatous polyps or CRC
Colorectal cancer surveillance	The monitoring of people who have premalignant conditions such as inflammatory Bowl Disease (IBD) or who receive treatment for adenomatous polyps or CRC