COLORECTAL CANCER SCREENING

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ABSTRACT: The efficacy of Hemoccult® screening for colorectal carcinoma is analyzed utilizing five criteria which a screening test should fulfill before it is used for mass screening. The Hemoccult® screening protocol has serious weaknesses. It is at best 83% sensitive for cancer and much less sensitive for polyps. An asymptomatic person with one or more positive Hemoccult® slides only has a 12% chance of having cancer. In addition, patient acceptance of mass Hemoccult® screening is questionable. There is currently little information on potential survival benefits, and Hemoccult® screening is expensive with one quarter of all costs incurred in the diagnostic evaluation of false positives. There is insufficient evidence to recommend Hemoccult® colorectal cancer screening in asymptomatic persons as a cost-effective practice.

Approximately 50% of persons with colorectal carcinoma will be dead five years after diagnosis,¹ and the mortality rate from colorectal cancer increases annually, with a total now reaching 50,000 deaths.¹² However, lesions detected at an early stage have a better prognosis. Nearly 90% of persons with Dukes' Stage A lesions (carcinoma confined to the colonic mucosa, not extending beyond the muscularis mucosa) survive five years after diagnosis.³ In addition, colorectal polyps are thought to be premalignant lesions, and it has been reported that polyp removal decreases the subsequent incidence of cancer.⁴

Ample data exists that some screening techniques provide early detection of colorectal cancer. In older studies, proctosigmoidoscopy was the major detection device since this procedure was relatively easy to perform. Hertz noted one carcinoma for every 450 patients examined by proctosigmoidoscopy,² while Gilbertson reported one carcinoma for every 632 patients.⁵ Major drawbacks with mass proctosigmoidoscopic detection programs, however, are excessive cost,⁶ low physician and patient acceptance,⁷ and examination of only part of the colon.

Recently, the technique most frequently advocated for mass screening of colorectal cancer, including that recommended by the American Cancer Society,⁴ is examination of fecal material for occult gastrointestinal blood loss. The test is noninvasive, and there is a low unit cost per person screened. The impregnated guaiac slide test (Hemoccult®) has achieved the most widespread...
acceptance. Currently, two groups, the Memorial Sloan-Kettering Cancer Center and the University of Minnesota, are conducting prospective large-scale randomized trials to determine the efficacy of such screening.\(^8,^9,^10\) Both groups have examined men and women (above age 40 at Sloan-Kettering and above age 50 at Minnesota) employing six Hemoccult\(^R\) slides in the last three days of six-day meat-free, high-fiber diet. Preliminary data from these studies can be summarized as follows: 1\% and 1.8\%, respectively, of persons screened have had at least one positive slide; 12\% and 14\%, respectively, of persons with positive slides who were evaluated further were found to have cancer, while approximately 40\% of persons with positive slides had polyps.

Despite early optimistic reports from these trials, the National Cancer Institute (N.C.I.) has recently stated that insufficient evidence currently exists to warrant advocating mass Hemoccult\(^R\) screening for colorectal cancer.\(^7\) Specifically, the N.C.I. consensus conference recommendations stated that at this time there is an "absence of a clear demonstration of (a) improved survival rates in screened individuals with colon cancer, or (b) a net margin of benefit to health in comparison with costs and risks entailed in the further study of all positive occult blood reactions by barium enema or endoscopy".\(^7\) On the other hand, the American Cancer Society continues to advocate Hemoccult\(^R\) screening for colorectal cancer.\(^11\) Further, the Canadian Task Force on the Periodic Health Examination has recommended annual Hemoccult\(^R\) screening for adults over 45 but has noted that although good data exist regarding the potential benefit of sigmoidoscopy screening, only fair evidence exists demonstrating the potential benefit of Hemoccult\(^R\) screening.\(^12\)

**CRITERIA FOR A SCREENING TEST**

The purpose of this article, therefore, is to examine the available data to determine why this discrepancy exists on recommendations regarding Hemoccult\(^R\) screening and to draw conclusions about its usefulness. To accomplish this objective, we will base our analysis of the efficacy of Hemoccult\(^R\) colorectal cancer screening on criteria that any screening test should fulfill before it is applied to a population. These criteria have been adopted and slightly modified from those of Foltz and Kelsey,\(^13\) Cochran,\(^14\) McKeown,\(^15\) and WHO.\(^16\) This technique used for analysis should prove useful to clinicians who must frequently decide whether to institute a screening test despite incomplete data on which to draw conclusions.

1. **Is Colorectal Cancer an Important Health Hazard, and Does It Have a High Prevalence?**

   Colorectal carcinoma is one of the most common causes of cancer death

   *The prevalence of a disease is the number of cases of a disease present in the population at any one point in time.*