

## Colorectal Cancer: Reduction with Colonoscopic Polypectomy

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### PREVENTION OF COLORECTAL CANCER BY COLONOSCOPIC POLYPECTOMY. THE NATIONAL POLYP STUDY WORKGROUP.

Winawer SJ, Zauber AG, Ho MN, et al. *N Engl J Med*. 1993;329:1977-1981.

**Objective:** To test the hypothesis that colonoscopic polypectomy reduces the incidence of colorectal cancer.

**Design:** Observational historical series comparison. The incidence rate of colorectal cancer in patients participating in the National Polyp Study was compared with that in 3 reference groups (2 cohorts in which colonic polyps were not removed and 1 general-population registry, after adjustment for sex, age, and polyp size).

**Setting:** National Polyp Study Workgroup, Memorial Sloan-Kettering Cancer Center, and other institutions (predominately gastroenterologists working at large academic and endoscopy centers).

**Participants:** The study cohort consisted of 1418 patients who had a complete colonoscopy during which one or more adenomas of the colon or rectum were removed from November 1980 to February 1990. The patients subsequently underwent periodic colonoscopy during an average follow-up of 5.9 years, and the incidence of colorectal cancer was ascertained. Reference groups included (1) a retrospective cohort of 226

patients studied at the Mayo Clinic, Rochester, Minnesota, between 1965 and 1970 who had polyps 1 cm or larger above the reach of a proctoscope detected by barium enema and declined surgical polypectomy. They were followed an average of 9 years; (2) a retrospective cohort of 1618 patients who underwent excision of rectal adenomas between 1957 and 1980 at St. Mark's Hospital in London and followed for 14 years; (3) the age- and sex-specific incidences of colorectal cancer for calendar years 1983 to 1987 from the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute.

**Results:** Ninety-seven percent of the patients were followed clinically for a total of 8401 person-years, and 80% returned for 1 or more of their scheduled colonoscopies. Five asymptomatic early-stage colorectal cancers (malignant polyps) were detected by colonoscopy (3 at 3 years, 1 at 6 years, and 1 at 7 years). No symptomatic cancers were detected. The numbers of colorectal cancers expected on the basis of the rates in the 3 reference groups were 48.3, 43.4, and 20.7, for reductions in the incidence of colorectal cancer of 90%, 88%, and 76%, respectively ( $p < 0.001$ ).

**Conclusions:** Colonoscopic polypectomy resulted in a lower-than-expected incidence of colorectal cancer. These results support the view that colorectal adenomas progress to adenocarcinomas, as well as the current practice of searching for and removing adenomatous polyps to prevent colorectal cancer.

### REVIEWER COMMENTS

The current practice of removing adenomatous polyps of the colon and rectum is based on the belief that this will prevent colorectal cancer. To address the hypothesis that colonoscopic polypectomy reduces the incidence of colorectal cancer, the authors analyzed the results of the National Polyp Study with reference to other published series. These included 2 older series: a group of patients from the Mayo Clinic who had polyps identified on barium enemas and declined operative removal and a group of patients from St. Mark's Hospital who had rectal adenomas removed. Both groups of patients were managed prior to the availability of colonoscopy. The third reference group is very similar to tumor board data. The results from each

of these reference groups have obvious limitations. However, this retrospective comparison of data from a prospective polyp study to 3 other published studies documented a lower than expected incidence of cancer in the National Polyp Study patients. The authors discuss the ethical, moral, and logistical difficulty in conducting a randomized prospective trial (level 1 evidence) on the removal of polyps. Despite its age and limitations, the present article's comparisons remain some of the best available evidence to support the adenoma to carcinoma progression and the common sense hypothesis that removal of polyps can prevent the development of most if not all colorectal cancers.

## DOES COLONOSCOPIC POLYPECTOMY REDUCE THE INCIDENCE OF COLORECTAL CARCINOMA?

Meagher AP, Stuart M. *Aust N Z J Surg*. 1994;64:400-404.

**Objective:** To examine whether there is evidence that colonoscopic polypectomy reduces the incidence of colorectal cancer.

**Design:** Retrospective record review.

**Setting:** Department of Colorectal Surgery, St Vincent's Hospital, Sydney, New South Wales, Australia.

**Participants:** All patients who underwent colonoscopic polypectomy by a single surgeon between 1974 and 1991.

**Methods:** Excluding patients with colorectal cancer diagnosed at the initial colonoscopy, with a history of colorectal cancer, inflammatory bowel disease, or familial adenomatous polyposis or with only hyperplastic polyps, there were 645 pa-

tients who had at least 1 follow-up colonoscopic examination. The expected incidence of cancer, age and sex adjusted, was calculated using Australian epidemiological figures.

**Results:** The mean period of follow-up was 4.4 years, and the mean number of follow-up colonoscopic examinations was 2.2. There were a total of 2847 person-years of colonoscopic follow-up. The observed incidence of cancer was 3 cases (all asymptomatic) per 2847 person-years, which is indistinguishable from the general population's risk of 3.75 cases per 2847 person-years. Analysis of previous publications suggests that patients with adenomas are at an increased risk of developing colorectal cancer of about 2.5 times the general population's risk. If correct, then the observed incidence of 3 cases per 2847 person-years is less than the expected incidence of 9.4 cases per 2847 person-years.

**Conclusions:** This analysis suggests colonoscopic polypectomy does reduce the incidence of colorectal cancer.

### REVIEWER COMMENTS

This study again shows that the incidence on colorectal cancer in patients undergoing endoscopic polypectomy is low, but not zero. Although not perfect, colonoscopy remains the best screening and preventative option for colorectal cancer. Why

doesn't polypectomy prevent all colorectal cancers? Some cancer or their proposed precursors (adenomatous polyps) may be missed at colonoscopy. In addition, some cancers may develop de novo or may grow faster than expected.

## POPULATION-BASED SURVEILLANCE BY COLONOSCOPY: EFFECT ON THE INCIDENCE OF COLORECTAL CANCER. TELEMAR POLYP STUDY I.

Thiis-Evensen E, Hoff GS, Sauar J, Langmark F, Majak BM, Vatn MH. *Scand J Gastroenterol*. 1999;34:414-420.

**Objective:** To evaluate the effect of polypectomy on colorectal cancer incidence in a population-based screening program.

**Design:** A prospective randomized clinical trial.

**Setting:** Department of Medicine, Telemark Central Hospital, Skien, Norway.

**Participants:** In 1983, 400 men and women aged 50-59 years were randomly drawn from the population registry of Telemark, Norway. They were offered a flexible sigmoidoscopy and, if polyps were found, a full colonoscopy with polypectomy and follow-up colonoscopies in 1985 and 1989. A control

group of 399 individuals was drawn from the same registry. In 1996, both groups (age, 63-72 years) were invited to have a colonoscopic examination. Hospital files and the files of The Norwegian Cancer Registry were searched to register any cases of CRC in the period 1983-1996.

**Results:** At screening endoscopy, 324 (81%) individuals attended in 1983 and 451 (71%) in 1996. From 1983 to 1996, altogether 10 individuals in the control group and 2 in the screening group were registered to have developed CRC (relative risk, 0.2; 95% confidence interval (CI), 0.03-0.95;  $p = 0.02$ ). A higher overall mortality was observed in the screening group, with 55 (14%) deaths, compared with 35 (9%) in the control group (relative risk, 1.57; 95% CI, 1.03-2.4;  $p = 0.03$ ).

**Conclusions:** Endoscopic screening examination with polypectomy and follow-up was shown to reduce the incidence of CRC in a Norwegian normal population.

### REVIEWER COMMENTS

This prospective trial documents that colonoscopic polypectomy reduced the incidence of colorectal cancer. The initial screening entailed flexible sigmoidoscopy followed by colonoscopy for patients found to have polyps. The screened patients

received colonoscopy at 2 and 6 years. Both the screened and the control group were offered colonoscopy at 13 years.

The 71% of patients that agreed to have the final colonoscopy demonstrates the compliance issues with colonoscopy.

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