Higher Quality Screening Colonoscopies Associated With Lower Lifetime Risk of Colorectal Cancer and Death

*Kaiser Permanente study shows improved polyp screening saves lives without increasing overall cost of care*

**OAKLAND, Calif., June 16, 2015** – Improving colonoscopy quality through higher detection rates for a particular type of polyp may be associated with as much as a 60 percent lower lifetime risk of colorectal cancer incidence and death without increasing overall care costs, according to a Kaiser Permanente study published June 16 in the *Journal of the American Medical Association (JAMA)*.

This large-scale cost-benefit analysis examines how differences in detection rates for adenomas, a type of colon polyp, may affect colorectal cancer outcomes over a lifetime. It is the latest in a series of studies undertaken by the National Cancer Institute’s Population-based Research Optimizing Screening through Personalized Regimens (PROSPR) consortium, a multisite effort to evaluate and improve cancer screening processes. Kaiser Permanente’s Northern California and Southern California regions lead PROSPR’s colorectal cancer center, which sponsored this study in conjunction with the modeling group at Erasmus University in the Netherlands.

Colorectal cancer is the second-leading cause of cancer deaths in the United States. According to the American Cancer Society, about 133,000 new cases will be diagnosed in the United States in 2015, with 50,000 deaths. Colonoscopy every 10 years is one of three screening methods recommended by the U.S. Preventive Services Task Force; the others are sigmoidoscopy every 5 years or annual fecal testing.

Colonoscopies screen for colorectal cancer by detecting early, curable cancers. Precancerous adenomas can also be detected and removed, thereby preventing cancers from developing.

The previous PROSPR research, published in the *New England Journal of Medicine*, showed that the effectiveness of screening colonoscopies — as measured by adenoma detection rates — can vary among physicians, and that higher levels of detection were associated with lower risks of death from colorectal cancer. The current study took this one step further by estimating complications from polyp removal and costs from colonoscopies as well as the cancers prevented.

“This modeling study used real-world data that suggested higher adenoma detection rates may lead to fewer cancers and deaths from cancer without substantially increasing serious
complications or costs," said gastroenterologist Douglas A. Corley, MD, PhD, principal investigator of the PROSPR study and research scientist with the Kaiser Permanente Northern California Division of Research.

The PROSPR analysis was performed by lead author Reinier G.S. Meester, MSc, and colleagues at Erasmus University, using data from 57,588 patients examined by 136 physicians at Kaiser Permanente’s Northern California region from 1998 through 2010. The model simulated a U.S. population of men and women reaching the age of 50 without colorectal cancer (9.4 million). The investigators looked at the estimated lifetime benefits, complications and costs of an initial colonoscopy screening program at five different levels of adenoma detection.

For this study, no colorectal cancer screening was compared with screening by colonoscopy. Similar to other academic and community-based settings, the adenoma detection rates — the proportion of a physician’s screening colonoscopies that detect at least one histologically confirmed adenoma — ranged from 7.4 percent to 53 percent.

Among unscreened patients, the modeling suggested that the lifetime risk of colorectal cancer was 34.2 per 1,000 and mortality risk was 13.4 per 1,000. Among patients screened with colonoscopy, the lifetime incidence and mortality from colorectal cancer decreased 11 percent and 13 percent, respectively, for every 5 percent increase in adenoma detection rate, which translates to overall differences of 53 percent and 60 percent, respectively, between the lowest and highest detection rates.

The simulated risk of complications (ranging from abdominal pain to rare fatalities) increased with higher levels of adenoma detection, due to the larger numbers of polyps removed, as did the costs from increased numbers of colonoscopies needed for follow-up; however, these costs were offset by the decreased cancer deaths and decreased costs of cancer treatment. The estimated net costs of the cancer screening program, including both the costs of colonoscopy and of cancer treatment, ranged from $2.1 million at the lowest level of adenoma detection to $1.8 million at the highest level.

“The results of these studies are being used to maximize the effectiveness of screening programs at Kaiser Permanente by providing feedback to physicians and developing new methods to further improve the effectiveness of colon cancer screening,” said study co-author Joanne Schottinger, MD, PROSPR principal investigator and an oncologist with Kaiser Permanente Panorama City Medical Center. “This work supports our overall goal of reducing colon cancer mortality by half.”

Kaiser Permanente can conduct transformational health research such as this study in part because it has the largest private patient-centered electronic health system in the world that securely connects more than 10 million members to 16,000 physicians in almost 600 medical offices and 38 hospitals. It also connects Kaiser Permanente’s research scientists to one of the most extensive collections of longitudinal medical data available, facilitating studies and important medical discoveries that shape the future of health and care delivery for patients and the medical community.
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In addition to Dr. Corley, co-authors of the study were Reiner G.S. Meester, MSc, Iris Lansdorp-Vogelaar, PhD, Miriam P. van der Meulen, MD, and Marjolein van Ballegooijen, MD, PhD, (Erasmus MC University Medical Center, Rotterdam, Netherlands); Chyke A. Doubeni, MD, MPH, (University of Pennsylvania Perelman School of Medicine); Christopher D. Jensen, PhD, and Theodore R. Levin, MD, (Kaiser Permanente Northern California Division of Research); Virginia P. Quinn, PhD (Kaiser Permanente Department of Research & Evaluation); Joanne E. Schottinger, MD, (Kaiser Permanente Panorama City Medical Center; Southern California Permanente Medical Group); and Ann G. Zauber, (Memorial Sloan-Kettering Cancer Center).

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