# Colonoscopy isn't perfect: About six percent of colorectal cancers are missed

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About 6 percent of colorectal cancers are diagnosed within three to five years after the patient receives a clean colonoscopy report, according to a population-based study by researchers from Huntsman Cancer Institute (HCI) at the University of Utah.

These cancers may have been overlooked at the time of colonoscopy or developed rapidly during the window between colonoscopies and are therefore referred to as "missed" colorectal cancers. The three- to five-year timeframe is well inside the ten years recommended between colonoscopies for colorectal cancer screening in the general public, as well as the five years indicated for people at increased risk.

The research results were published online in the journal *Gastroenterology*.

"Not only did we find that colonoscopy isn't perfect, we discovered a number of factors associated with these 'missed' cancers," said N. Jewel Samadder, MD, M.Sc., lead author of the study and an HCI investigator. "They tended to appear in patients over the age of 65, patients with a family history of colorectal cancer, and patients in whom polyps were previously found."

The missed cancers were also more likely to appear in the right side of the colon, at the far end of the colonoscope's reach. "Our first thought was that perhaps doctors did not view the entire colon, or that preparation for the procedure was not complete, which would obscure

their view," said Samadder. "However, the medical records of the patients with missed cancers showed these problems were seldom present."

The study integrated information about colonoscopies performed at Intermountain Healthcare (IHC) and University of Utah Health Care (UUHC) over the 14-year period between 1995 and 2009. Taken together, the IHC and UUHC systems provide care to more than 85% of Utah's population. The researchers also used the Utah Population Database (UPDB), which combines genealogical, medical, and demographic data with cancer records from the Utah Cancer Registry, which allowed them to count patients who developed colorectal cancer and those who had a family history of the disease while keeping their identities confidential.

While the term 'missed' may indicate that cancer or precancerous polyps were present but not seen, the category also includes cancers that had no visible evidence at the time of colonoscopy but developed rapidly afterward. According to Samadder, "Cancers in the right side are often biologically different than those in other parts of the colon, arising from different types of polyps. These types of polyps are flatter and faster growing, which may explain why they are not seen during colonoscopy as well as how a cancer could develop even when no polyps were visible."

The study showed that in the United States the rate of cancers missed at colonoscopy is only slightly lower than in Germany and Canada where similar studies have been conducted. In the U.S., most colonoscopies are performed by gastroenterologists who receive extensive training in the procedure. Previously, American physicians had assumed that the missed cancer rate would be much lower in the U.S., because many colonoscopies in the foreign health care systems are performed by family physicians, internists, and surgeons who may not be as well

trained in the procedure. According to Samadder, physicians and patients need to communicate prior to the procedure to ensure that a complete medical history, accounting for older age, family history of colorectal cancer, and prior history of polyps, is known so extra time and care can be taken during the procedure, especially on the right side of the colon.

Many organizations, such as the American Society of Gastroenterologists (ASGE), now recommend that physicians spend at least 6-10 minutes closely examining the colon lining for polyps during the procedure's withdrawal phase (where they have reached the end of the colon and are beginning to come out).

"This is not entirely a quality of care issue," Samadder said. "Our findings implicate genetic and biological issues associated with having previous polyps and having a family history of colorectal cancer."

Samadder's research team currently has funding from the American College of Gastroenterology (ACG) to analyze various genetic elements of tumor tissues from missed cancers to search out their molecular signatures and determine how they differ from cancers detected during colonoscopy. "Only by understanding the limitations of colonoscopy," Samadder said, "can we improve its use and ability to detect polyps and thereby reduce the burden of colorectal cancer."

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