As Rates of Some Cancers Increase in Younger People, Researchers Search for Answers

Several decades ago, a diagnosis of colorectal cancer in somebody under age 50 was unusual. But that's no longer the case.

May 23, 2025 By National Cancer Institute

Maybe it was already there when he was at Disney World. Sitting in his office on a late-winter morning, wearing jeans and a hooded sweatshirt adorned on the front with a teddy bear in a business suit, Ryan O'Grady, Ph.D., said he couldn't rule out the possibility.

"I don't know. You can't really say if it was, but I think about it," said Dr. O'Grady, a mathematics professor at a small liberal arts college in Pittsburgh's northern suburbs.

It was February 2023, on that family trip with his wife and two young daughters, when Dr. O'Grady first experienced some uncomfortable gastrointestinal issues. A generally healthy 43-year-old at the time, he saw no reason to worry.

But as the year went on, the problems started occurring more regularly. Finally, with the holiday season approaching, his gastrointestinal difficulties became more frequent and more severe. With some spirited encouragement from his wife, Dr. O'Grady went to the emergency room. That led to a doctor's appointment and, thanks to an opportune cancellation, a quickly scheduled colonoscopy.

Finally, two days after Christmas 2024, the call came from his doctor: colorectal cancer.

"We were supposed to go to Columbus for a late Christmas with my brother and his family," Dr. O'Grady said. After some hesitation, they did go. To keep his mind from going down depressing rabbit holes, he spent a lot of time at his brother's house working. "My wife was on the phone making all sorts of doctors' appointments for me."

Several decades ago, aside from people with certain genetic predispositions, a diagnosis of colorectal cancer in somebody under age 50 was unusual. But that's no longer the case.

Y. Nancy You, M.D., who specializes in treating colorectal cancer at the University of Texas MD Anderson Cancer Center, said that when she was finishing her medical fellowship in 2009, the

average age of people in the United States diagnosed with the disease was 72.

“Now it’s 67,” she said.

And it’s not just colorectal cancer that’s being diagnosed more frequently in people under age 50. More than 10 other common cancers are also on the rise, including breast, uterine, and kidney. The increase has been most stark among people in the 20–29 age range.

The trend has left many researchers perplexed and alarmed. And although there are some hints about why this might be happening, there are no definitive answers yet, said Dr. You, who directs MD Anderson’s Young-Onset Colorectal Cancer Program.

“I don’t think there’s going to be a single ‘smoking gun,’” she continued. “It’s the million-dollar question everybody [is asking]. But it’s a long-horizon answer.”

A harbinger of a larger problem

The uptick in early-onset cancers started to garner public attention in 2020 when the actor Chadwick Boseman, the star of the Black Panther film series and other hit movies, died from colorectal cancer at the age of 43.

On the big screen, Boseman was handsome, muscled, and by all appearances the epitome of well-being. He was the last person many people expected to be diagnosed with, let alone die from, cancer.

But relative youth is no longer the forcefield against colorectal cancer that it used to be. Early-onset colorectal cancer “is becoming the leading cause of cancer deaths among young adults in the United States,” said Yin Cao, MS.c., of the Washington University Siteman Cancer Center in St. Louis.

Dr. Cao is leading a first-of-its kind research program called PROSPECT that’s investigating the causes of early-onset colorectal cancer. Funded by NCI, Cancer Research UK, Bowelbabe Fund, and Institut National du Cancer through the Cancer Grand Challenges program, PROSPECT is international in scope, and with good reason, she explained during a December 2024 NCI advisory board meeting.

One recent study, for example, found that nearly 10% of new colorectal cancers around the world are in people under the age of 50. And a study by American Cancer Society (ACS) researchers revealed that early-onset colorectal cancer rates have increased in 27 of the 50 countriesExit Disclaimer included in their analysis.

More cancers are being diagnosed in older people as well

Recent studies have brought the scope of the early-onset cancer phenomenon into tighter focus.

Their results confirm that the trend extends beyond colorectal cancer.

An NCI-led study published in May provided one of the most comprehensive analyses of trends in the United States. Looking at data captured in two large databases, they found that rates of 14 cancer types increased in at least one age group among people under 50Exit Disclaimer (i.e., 15–29, 30–39, and 40–49 years old) between 2010 and 2019.

But rates of new diagnoses for nine of these same cancers also increased in people over age 50 in at least one 10-year age group, explained the study's lead investigator, Meredith Shiels, Ph.D., of NCI's Division of Cancer Epidemiology and Genetics.

The ACS study on early-onset colorectal cancer showed that the same thing is happening globally, with the rise in colorectal cancer diagnoses "frequently occurring alongside the increase in older adults."

As these findings make clear, Dr. Shiels said, future research can't ignore what's happening in older people.

"We can learn something … by looking across all age groups," she said.

What's behind the rise in early-onset cancers?

There's little certainty about what's driving the early-onset cancer trend. But multiple studies have pointed to some of the same potential culprits.

More than a few studies have singled out obesity and heavy consumption of alcohol as likely key contributors. Others have suggested that environmental factors, like an overabundance of microplastics in the bodies of younger people, might be at play.

Much of the available evidence places the blame on another potential culprit: disruptions in the composition of bacteria in the gut and elsewhere in the body, known as the microbiome. One recent study also implicated bacteria. But, rather than a harmful mix of these organisms, it suggested that a DNA-damaging toxin produced by certain strains of the bacterium E. coli may be a key driver.

There are a lot of potential contributing causes, said Ulrike Peters, Ph.D., of the Fred Hutch Cancer Center, during a session on early-onset cancers at the annual meeting of the American Association of Cancer Research (AACR) in April.

But, Dr. Peters continued, "For many of these [factors], there's no strong epidemiological evidence that they're [individually] linked to early-onset cancers."

Some researchers believe that with colorectal and some other cancers, what's being seen is a so-called birth cohort effect.

In the case of colorectal cancer, as an example, for many decades the disease was predominantly diagnosed in people in their 60s and 70s. However, starting with people born in the 1950s and becoming more pronounced for those born in the decades that followed, exposure to changing environmental, lifestyle, and other risk factors may have accelerated the time it takes for colorectal cancer to develop in individuals.

In other words, Dr. You said, a "whole package" of common factors has created a new biologic window of opportunity for cancer to take hold in younger populations.

Are early-onset cancers biologically different?

A critical question for researchers has been whether early-onset cancers are biologically different in some key ways from cancers diagnosed in older people. Such information, experts agree, could help single out the key contributors to the phenomenon. In the more immediate term, it could help inform choices about the best treatments and patterns of care for younger people.

Overall, the findings on potential genetic or other biological differences in sporadic early-onset cancers—that is, those not linked to inherited cancer-related genetic change—haven't provided anything definitive, said Rihab Yassin, Ph.D., of NCI's Division of Cancer Biology.

Some studies have identified common differences in the genetic changes present in tumors from people with early-onset colorectal cancer compared with tumors from older people, and some have linked specific genetic changes with an increased risk of early-onset breast cancer.

But, on the whole, the results of studies on specific genetic contributors "have been conflicting," Dr. Yassin said.

There is some evidence that inherited cancer-related genetic changes, often called germline mutations, may bear some responsibility for the growing number of early-onset cancers, according to Zsofia Stadler, Ph.D., of Memorial Sloan Kettering Cancer Center (MSKCC).

During the same session on early-onset cancers at the AACR meeting, Dr. Stadler cited data from a study of people with early-onset cancer treated at MSKCC.

Overall, a modest percentage had germline mutations. In people under 35, however, nearly 20% were found to have a genetic predisposition to cancer. Typically, they were the most common cancer-related inherited genetic changes, including those in the BRCA1 and BRCA2 genes and in a collection of genes seen in people with Lynch syndrome, which is linked with several different cancers.

Dr. Stadler cautioned that, overall, cancer-related germline mutations appear to have a limited role in the phenomenon.

Dr. Peters agreed. "Genetics cannot explain the rise we have seen in early-onset cancers," she

said. “Our genome just doesn’t change so quickly over several decades.”

Aside from any genetic differences, there’s also the question of whether early-onset cancers behave differently from the same cancers in older people. Such discrepancies could indicate that tumors in younger people are being driven by common biological features, Dr. You said.

There are some indications that, in the case of colorectal cancer at least, the disease can be biologically different, and potentially more aggressive, in people diagnosed at younger ages.

For instance, early-onset colorectal cancers often form in locations in the left colon and rectum and have other physical characteristics that are associated with aggressive tumors, Dr. Yassin said.

And the rate at which people under age 50 are dying from colorectal cancer has increased, also a suggestion of more hostile disease. The two other common cancers for which that’s true in the United States are uterine and testicular, Dr. Shiels and her NCI colleagues found in their study.

Death rates from cancer overall aren’t increasing among those under age 50, Dr. Shiels said. But the rise in deaths in even a small group of cancers is still “very concerning," she said.

Addressing early-onset cancer in a period of uncertainty

Effectively addressing the early-onset cancer trend can’t happen without greater awareness and communication, stressed Andrea Dwyer, M.P.H., of the University of Colorado Cancer Center, who is involved in several initiatives related to early-onset colorectal cancer.

The good news is that both have increased among health care providers, Ms. Dwyer said. As a result, many clinicians have altered their everyday clinical practice so that cancer isn’t initially ruled out based on a patient’s age.

“We’re seeing that shift, that change,” she said.

A similar shift in younger people, to the point that they change their behavior when problematic symptoms arise, cannot happen soon enough, Dr. You said. But there are practical, ingrained barriers to overcome.

Younger people “are so busy living their lives, and there is a thinking that [the symptoms] will go away,” she said.

These attitudes are pervasive among younger people, Ms. Dwyer said. “They think ... ’I have a million other things to do. Do I want to spend my time and money going to the doctor?’”

One potential consequence, and a particularly significant one, is a delay in diagnosis, which can lead to cancers not being found until they are more advanced and potentially harder to treat.

One recent study that singled out regular rectal bleeding and abdominal pain as the most telling symptoms of early-onset colorectal cancer, for example, also found that the time from patients' first symptoms to their cancer diagnosis was often half a year or longer.

Other studies have identified similar "red flag" symptoms of early-onset colorectal cancer. Dr. Cao, for instance, led a 2023 study that added diarrhea and iron deficiency anemia to rectal bleeding and abdominal pain as tell-tale indicators.

"For younger adults, we really want to raise awareness that, if you have any of these signs or symptoms, don't wait to see a doctor," she said at the time.

Once a person is diagnosed, genetic testing is critically important, Dr. You said. Testing for Lynch syndrome, an inherited genetic condition that's responsible for about 20%–30% of colorectal cancers, is particularly important.

Tumors in people with Lynch syndrome "respond phenomenally well to immunotherapy," Dr. You said. "So, a large part of the current [patient] workup is to make sure we don't miss any of these patients, because we have a treatment that really works."

Preparing for the hard stuff

While the research process plays out, Dr. You said there are proven ways to help younger patients navigate through the challenges presented by a cancer diagnosis. Among them, she said, is ensuring that they are connected to the appropriate resources about genetic testing.

And whether it's during or after active treatment, it's also important to help younger patients form connections with other people going through the same experience. "It's that idea of helping patients create a sense of community so they understand that they're not alone," she said.

Ryan O'Grady, meanwhile, has completed his radiation treatments and, as of spring 2025, begun the intensive stretch of his chemotherapy treatment. By all measures, his cancer is responding well, he said, with imaging scans showing his tumors continuing to shrink.

He's still playing basketball, lifting weights several days a week, and going to concerts. He's also eating healthier foods and has stopped drinking alcohol.

"I'm feeling really good," he said. "But I want to prepare myself in case things start to get really hard."

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