

Gut bacteria's role in colon cancer

Colorectal cancer (CRC) has long been associated with older age, but recent research shows a troubling trend in younger adults.

A study published in [Nature](#) found that “in the past two decades, the incidence of early-onset colorectal cancer, which affects individuals below 50 years of age, has doubled in many countries.”

Similarly, projections from [Frontiers in Immunology](#) warn that “with changes in western dietary habits worldwide, the incidence of CRC is expected to increase steadily, resulting in 2.2 million new cases by 2030.”

Emerging science suggests a key piece of the puzzle lies within our gut.

“We think of our microbiome as a separate, living organism within our body. It’s made of billions of bacteria, predominantly growing in our colon. There is a small number of bacteria that does exist in our small bowel, oral pharynx and nasal cavities. Just like we have bacteria on our skin everywhere,” says Daniel Martin, MD, a gastroenterologist with OSF HealthCare.

Colibactin and DNA Damage

Several harmful [gut bacteria](#) species, including strains of *E. coli*, *Klebsiella pneumoniae* and *Citrobacter koseri*, produce a toxin called colibactin. Research over the last two decades has linked this toxin to DNA damage that may lead to [cancer](#).

“They have recognized that there’s a much greater incidence of exposure to this particular strain of E. Coli that makes the Colibactin toxin in patients under the age of 50 who are diagnosed with colorectal cancer,” Dr. Martin says. “There’s also a recognition that Colibactin itself has some DNA-damaging properties within the GI tract. This is likely a direct contributor to the development of early, pre-cancerous dysplastic (abnormal growth) changes that ultimately lead to colorectal cancer in those patients.”

Diet, Antibiotics and the Microbiome

Western diets and overuse of antibiotics also play a role, research suggests.

“Also thinking about the infections we can have, both as infants and in adulthood. Over the last handful of decades, there’s the exposure of antibiotics, -- the antimicrobial medications we’re using to try and treat specific, acute illnesses,” Dr. Martin says. “But those can have a meaningful impact on our gut flora and microbiome in general.”

Processed foods, especially ultra-processed products with preservatives and dyes, may be particularly harmful. Dr. Martin recommends eating real food like beans, nuts, legumes, plants and lean meats.

“If you’re purchasing it in the middle of the grocery store, and it’s vacuum-packaged and sealed, looking nothing like its based product, it’s probably an ultra-processed food in every circumstance,” Dr. Martin says.

“When we are consuming a food product of some kind, if it’s going to go bad quickly, it likely has prebiotics and probiotics in it, and those are good for us. If you leave a banana out on the counter for two weeks, no one wants to eat it because it goes bad. If you leave a Twinkie out on the counter for two years, it hasn’t changed,” Dr. Martin adds.

Dr. Martin also warns about hidden culprits like sugary drinks, sports beverages and food dyes.

“Products like sports drinks, juices and sodas can be laden with sugars, whether real or added (which Dr. Martin refers to as ‘fake sugar’). Many of these products also contain food dyes and preservatives which are bad for our gut health.”

The Search for Balance

While probiotic and prebiotic supplements can support gut health, they are not a perfect science.

“Currently, prebiotic and probiotic supplements are created using the ‘95% confidence interval,’” Dr. Martin says. “This means that out of a sample of people, it was determined that 95% of them would benefit from a certain culture, probiotic or prebiotic being included in the product. Because as mentioned earlier, the 100% perfect pie chart of what everyone’s gut microbiome looks like is not currently known.”

For now, the advice remains straightforward: eat whole foods, avoid ultra-processed options and care for the trillions of bacteria that work inside of us every day.