

# Colorectal cancer: Screening should include environment, genetic factors

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When it comes to colorectal cancer, many people would benefit from individually tailored screening rather than standardized population guidelines.

A new risk-prediction model, built by researchers at the University of Michigan and the Fred Hutchinson Cancer Research Center (Fred Hutch) in Seattle and colleagues, assesses the impact of environment and genetic factors on the development of colorectal [cancer](#).

The researchers calculated the combined risk from 19 lifestyle and environmental factors and 63 genetic variants associated with colorectal cancer. Current guidelines recommend initial [screening](#) at age 50 unless someone has a family history of colorectal cancer.

"Our model could provide a much wider age range for the first [colorectal cancer screening](#)," said Jihyoun Jeon, assistant research scientist in epidemiology at the U-M School of Public Health and first author of an article in this month's Gastroenterology.

Jeon said when factoring in environmental (E-score) and [genetic factors](#) (G-score) with family history risk, the suggested starting ages for screening were different by a span of as many as 12 years for men and 14 for women, depending on where people landed in the risk profile.

For example, she said, among people with a family history of colorectal cancer, men in the highest 10 percent of risk were recommended for

screening at age 40, while those in the lowest 10 percent could wait until age 51. For women, the ages were 46 and 59.

For those with no [family history](#) but with environmental risk exposure and genetic profile that put them in the highest risk the ages for the first screening are 44 for men and 50 for women; for the lowest risk, 56 and 64.

The researchers found that environmental factors and genetics impacted risk fairly equally, showing that considering both aspects when making decisions for colorectal cancer screening is important.

The researchers say employing their model is a next step forward in the journey to precision medicine, but they acknowledge that this detailed kind of information is not yet available for most patients in clinical settings.

"Much more work needs to be done but we hope our research provides good evidence that risk prediction models can be used to pinpoint individual risk more precisely," Jeon said.

Her colleagues agreed, saying they hope their research prompts patients and doctors to discuss known lifestyle and [environmental factors](#) such as height, body mass index, education, history of type 2 diabetes, smoking, alcohol consumption, diet, uses of various pharmaceuticals and physical activity.

While it is the third leading cause of cancer death in the United States, colorectal cancer is one of the most treatable forms of cancer if detected early.

"Prevention is at the core. If we can prevent a cancer before it develops, we can avoid much suffering," said Ulrike Peters, member of the Cancer

Prevention Program at Fred Hutch, and a faculty member at the University of Washington.

The team collected data from 9,748 colorectal cancer cases and 10,590 controls in the Genetics and Epidemiology and Colorectal Cancer Consortium and the Colorectal Transdisciplinary study from 1992 to 2005.

Due to insufficient samples of other ancestry groups, only individuals of European descent were included in the study. The team plans to do additional research with more diverse subjects.

While the work was focused on colorectal cancer, the team sees the model as helpful for other disease research.

"As we age we are going to have all kinds of diseases," said Li Hsu, member of biostatistics at Fred Hutch and a University of Washington affiliate professor "The genetic information can not only be used for [colorectal cancer](#) but can be readily available for many other complex diseases that have a genetic basis."

**More information:** Jihyoun Jeon et al. Determining Risk of Colorectal Cancer and Starting Age of Screening Based on Lifestyle, Environmental, and Genetic Factors, *Gastroenterology* (2018). [DOI: 10.1053/j.gastro.2018.02.021](#)

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