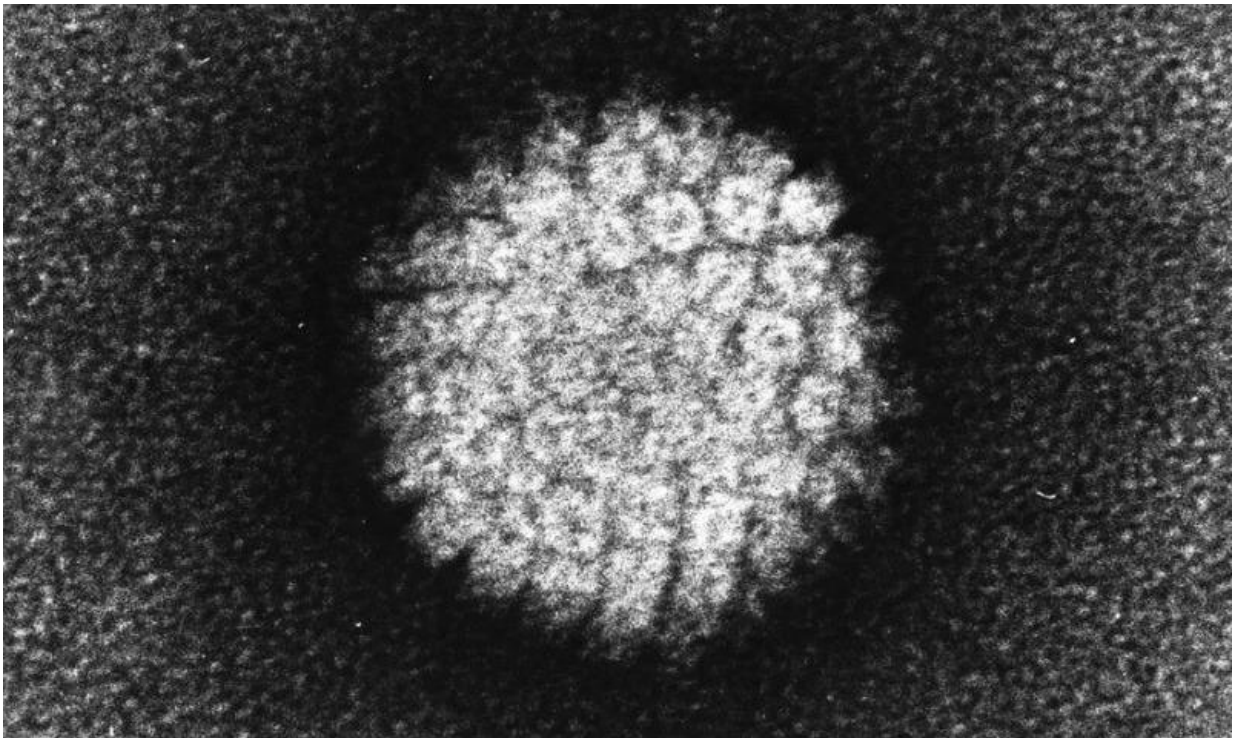


Blood test for HPV may help predict risk in cancer patients

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Electron micrograph of a negatively stained human papilloma virus (HPV) which occurs in human warts. Credit: public domain

A blood test for the human papillomavirus, or HPV, may help researchers forecast whether patients with throat cancer linked to the sexually transmitted virus will respond to treatment, according to preliminary findings from the University of North Carolina Lineberger

Comprehensive Cancer Center.

HPV can cause oropharyngeal [cancer](#), which is a cancer of the throat behind the mouth, including the base of the tongue and tonsils. Studies have shown that [patients](#) with HPV-positive oropharyngeal cancer have better outcomes than patients whose cancer is not linked to the virus.

[Preliminary findings](#) presented at this year's American Society of Radiation Oncology Annual Meeting suggest a genetic test for HPV16 in the [blood](#) could be useful to help assess risk for patients, and could help identify patients suitable for lower treatment doses.

"Our work on this blood test is ongoing, but we are optimistic that 'liquid biopsy' tests such as ours may be useful in the personalization of therapy for many patients with HPV-associated oropharyngeal cancer," said the study's senior author Gaorav P. Gupta, MD, PhD, UNC Lineberger member and assistant professor in the UNC School of Medicine Department of Radiation Oncology.

To avoid over-treating patients and to spare them from toxic treatment side effects, UNC Lineberger's Bhisham Chera, MD, an associate professor in the [radiation oncology](#) department, led studies testing whether favorable-risk patients with HPV-positive oropharyngeal cancer can be treated successfully with lower doses of [radiation](#) and chemotherapy. A phase II clinical trial using this de-intensified regimen have shown "excellent" cancer control, Chera said.

The researchers used a number of selection criteria to identify patients who can benefit from lower-doses: patients had to be positive for HPV, and they had to have smoked fewer than 10 pack years. Chera said this system is not perfect, however. The researchers have seen cancer recur in non-smoking patients as well as "excellent" cancer control in longtime smokers.

"This has led us to question whether we can get better prognostication with other biomarkers," Chera said.

They developed a test that can detect HPV16 circulating in the blood, and found that circulating HPV16 DNA was detectable using the test in the majority of a group of 47 favorable-risk oropharyngeal cancer patients.

In a finding that seems counterintuitive, they discovered that very low or undetectable HPV16 pretreatment levels in their blood actually had higher risk of persistent or recurrent disease for chemotherapy and radiation treatment. In contrast, patients with high pretreatment levels of HPV16 in their blood had 100 percent disease control.

They hypothesized that, potentially, the patients with undetectable/low pre-treatment HPV16 levels in the blood may have different, more radiation/chemotherapy resistant cancers.

"Our current theory is that these patients with low or undetectable levels of HPV16 have a different genetic makeup—one that is perhaps less driven purely by HPV, and thus potentially less sensitive to chemotherapy and radiation," Gupta said. "We are performing next generation sequencing on these patients to search for additional genetic markers that may give us a clue regarding why they have a worse prognosis."

They also identified a subset of patients who rapidly cleared the HPV16 from their blood. Researchers hypothesize that they could use their findings to further stratify patients who may be eligible for lower intensity treatment.

"A tantalizing - and yet currently untested - hypothesis is whether this subset of ultra-low risk patients may be treated with even lower doses of

chemoradiotherapy," Gupta said.

Provided by UNC Lineberger Comprehensive Cancer Center

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