

# Blood and saliva tests help predict return of HPV-linked oral cancers

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Physicians at Johns Hopkins have developed blood and saliva tests that help accurately predict recurrences of HPV-linked oral cancers in a substantial number of patients. The tests screen for DNA fragments of the human papillomavirus (HPV) shed from cancer cells lingering in the mouth or other parts of the body. A description of the development is published in the July 31 issue of *JAMA Otolaryngology – Head & Neck Surgery*.

"There is a window of opportunity in the year after initial therapy to take an aggressive approach to spotting recurrences and intensively addressing them while they are still highly treatable," says Joseph Califano, M.D., professor of Otolaryngology - Head and Neck Surgery, member of the Johns Hopkins Kimmel Cancer Center, and medical director of the Milton J. Dance Jr. Head and Neck Center at the Greater Baltimore Medical Center. "Until now, there has been no reliable biological way to identify which patients are at higher risk for recurrence, so these tests should greatly help do so," he adds.

Patients with HPV-associated oropharyngeal cancers are generally examined every one to three months in the first year after diagnosis. Recurrences are often found when patients report ulcers, pain or lumps in the neck. But imaging tests are unreliable in detecting cancer recurrence earlier, and the location of oropharyngeal cancers – in the tonsils, throat and base of the tongue—make it difficult for physicians to spot budding lesions.

Califano says survival rates for patients with early-stage, HPV-related oral cancers are as high as 90 percent within the first two years, and a study reported by Johns Hopkins experts in February showed that, even after recurrence, more than 50 percent of patients survive two years after their recurrence. The new [blood](#) and [saliva tests](#) have the potential to improve these rates, he adds.

For the study, the Johns Hopkins team analyzed blood and saliva samples from 93 oropharyngeal cancer patients who were treated with surgery, radiation alone, or combined chemotherapy and radiation at The Johns Hopkins Hospital or Greater Baltimore Medical Center. Samples were collected before and after treatment. Some 81 patients had HPV-positive tumors. The researchers selected patients with a variety of early-to-advanced stage cancers; none of the patients had distant metastasis.

The blood and saliva tests were performed using polymerase chain reaction, which amplifies certain portions of DNA and measures its amount.

The scientists found that HPV DNA detected in patients' saliva after treatment was predictive for recurrence nearly 20 percent of the time in a subset of the patients. When the scientists looked for HPV DNA in the blood of another subset of patients, the accuracy of a recurrence prediction rose to more than 55 percent. In a third subset of patients, finding HPV DNA in both blood and saliva samples after treatment accurately predicted recurrence 70 percent of the time.

Despite the encouraging results, Califano says, further refinements are still badly needed to improve detection of possible recurrences because HPV is highly prevalent in our bodies, and "we can't be sure our test results are cancer-specific and not due to other forms of HPV infection or exposure."

His team is looking for other genomic biomarkers that would increase the specificity of HPV DNA testing in blood and saliva. Califano also cautioned that the current study was too small to link test results to the severity of recurrence.

Rates of HPV-related oropharyngeal cancer are on the rise in the United States, outpacing oropharyngeal cancers due to tobacco and alcohol use, according to Califano. Some 70 percent of nearly 30,000 oropharyngeal cancers diagnosed in the U.S. are caused by HPV.

Provided by Johns Hopkins University School of Medicine

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