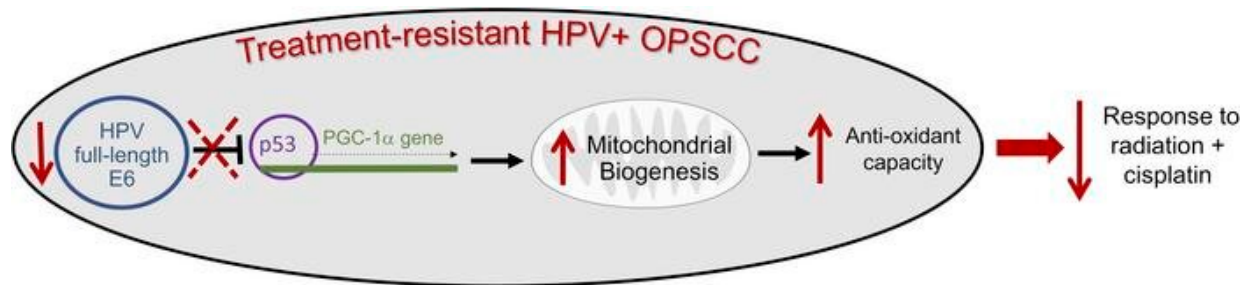


HPV-related cancers are on the rise in men

December 5 2022, by Scott Harris



Graphical abstract. Credit: *JCI Insight* (2022). DOI: 10.1172/jci.insight.159600

As a group, human papillomaviruses (HPVs) are the most common sexually transmitted infection in the United States. Some forms of the virus are capable of causing cancer in both men and women.

While cervical cancer in women has historically been the most common form of HPV-related cancer, [CDC data show](#) that roughly four of every 10 cases of HPV-induced cancer now occur in men.

"The types of HPV that cause cancer can affect both women and men and typically spread among people with no signs or symptoms of infection," said Devraj Basu, MD, Ph.D., an associate professor of Otorhinolaryngology in the Perelman School of Medicine at the University of Pennsylvania. "But HPV-related cancer cases are now frequently being diagnosed in men."

The reason for this shift is the growing number of HPV-related cancers of the throat. These cancers more often affect men and are rapidly increasing in the developed world, where they are becoming more common than cervical cancer and are projected to continue rising until the year 2060.

"These HPV-related throat cancers have existed for a long time, but only since around 2010 have we started discriminating them from other types of throat cancer when diagnosing and treating patients," said Basu, who is an expert on HPV-related throat cancer.

"The HPV-related form of throat cancer is also growing in incidence. We do not know yet why it is more common in men and what makes a small fraction of the vast number of people exposed to the virus ultimately develop this cancer type. In addition, we do not yet have a good screening tool for this type of throat cancer, in contrast to the effective screening that exists for cervical cancer using pap smears."

Doctors remain unsure of the most effective and least toxic ways to treat this emerging disease. Physicians and scientists at Penn Medicine are working to change that with basic, translational, and clinical research projects that are establishing the health system as an authority on HPV-related cancers of the throat.

There are numerous types of HPV, and these viruses most often cause infections that are self-limited and have no symptoms. There are some types of HPV that cause benign growths like warts, whereas infection with certain other types can lead to cancer many years later.

Broadly speaking, prevention may prove the best medicine against all forms of HPV-induced cancer. Modern HPV vaccines are highly effective in preventing [cervical cancer](#) and also appear likely to prevent HPV-related throat cancer in the long term. Still, most [older adults](#) have

been exposed to the types of HPV that cause cancer at some point in their lives, and less than half of adolescents in the U.S. are up to date on HPV vaccination, according to CDC data. HPV-related throat cancer is here to stay and likely to increase in the coming decades, so creating more effective and less toxic treatments along with better early detection tools will be critically important.

For those who develop HPV throat cancer, current treatments produce a fairly high cure rate (70–90%), but the radiation and chemotherapy used to achieve these cures carry debilitating, long-lasting side effects that a can even become life-threatening in the years and decades after treatment.

"HPV-related throat cancer often affects people in the most productive years of their lives," Basu noted. "And although the majority of these individuals are cured with standard therapy, they can suffer treatment-related side effects that lower their quality of life for decades."

Penn Medicine experts are shedding new light on the disease and its inner workings. For instance, a recent study conducted by Basu and Perelman School colleagues Elizabeth White, Ph.D., an assistant professor of Otorhinolaryngology Head and Neck Surgery and Daniel Kelly, MD, director of the Penn Medicine Cardiovascular Institute, found that levels of a certain HPV protein, E6, affect the number of mitochondria in both normal and cancerous cells. Because mitochondria help cells resist environmental stresses like radiation and chemotherapy, the findings, which appeared in the journal *JCI Insight*, could have broad clinical implications.

"This study gets at how differences in levels of a particular protein made by the virus help to determine how individual tumors will respond to treatment," Basu said. "Learning more about the interaction between this protein and mitochondrial function can improve our ability to treat each

individual patient's HPV-related cancer with greater precision and fewer side effects."

As a result of Penn Medicine's leadership in minimally invasive robotic surgery for head and neck cancer, the multidisciplinary head and [neck cancer](#) team has surgically treated more than 1,000 patients with HPV-induced throat cancer over the past 10 years—a number that continues to grow. As a result, Basu said, there is great opportunity at Penn Medicine to design clinical trials that leverage new scientific findings for this disease to improve outcomes for patients. That's the [driving force](#) behind ongoing efforts to make Penn Medicine a center of excellence for HPV-related throat [cancer](#).

"Our overarching goals are to engage scientists at Penn with complementary expertise in order to identify biomarkers that discriminate tumors at high versus low risk of recurrence," Basu said, "and to exploit the biologic differences among these tumors to develop therapeutic strategies personalized to each patient."

More information: Malay K. Sannigrahi et al, HPV E6 regulates therapy responses in oropharyngeal cancer by repressing the PGC-1 α /ERR α axis, *JCI Insight* (2022). [DOI: 10.1172/jci.insight.159600](#)

Provided by University of Pennsylvania

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