



Newsletter

CANCER CONSULTANTS OF AMERICA

BRIDGING THE GAP BETWEEN CANCER AND UNDERSTANDING®

Cancer Answers Human Papillomavirus (HPV) and Cancer

The most common sexually transmitted infection involves the Human Papillomavirus (HPV) with about 80% of sexually active people being infected with the virus at some point in their life. In most cases, the body's immune system clears the virus without the person experiencing any signs or symptoms. HPV infections typically occur in mucosal and cutaneous areas of the body. More simply stated, HPV infections typically occur in locations of the body with openings such as the mouth, vagina, and anus. The HPV genome is double-stranded circular DNA and contains 8 protein-coding genes with E6 and E7 proteins being significant to cancer development. At the present time, there are more than 100 types of HPVs and these viruses are stratified into high-risk and low-risk viruses due to their ability to cause cancer. The following six types of cancer have been associated with HPV infections: cervical, vaginal, vulvar, penial, anal, and oropharyngeal. Currently, a vaccine named Gardasil® 9 is available that offers protection from 9 different HPVs, 7 high-risk HPVs (HPV-16, -18, -31, -33, -45, -52, -58) and 2 low-risk HPVs (HPV-6, -11). Approximately 70% of all cervical cancers are the result of an infection with either HPV-16 or HPV-18.

Once the virus infects the host cell, the virus hijacks the cell's machinery and uses it to produce new viruses. To make matters worse, the virus alters the host cell functions in two ways that favor viral production. First, the virus keeps the host cell alive to maintain the production of new viruses. To accomplish this task, the viral E6 protein targets the protective cellular protein named p53, which is the most important protein in all of the cells within the body. The E6 protein promotes the destruction of p53, also known as "The Guardian of the Genome", thereby removing the protective functions it provides for the cell. Second, the virus promotes accelerated cellular division that leads to uncontrolled cell growth, which is cancer. The accelerated growth is the result of the viral E7 protein disabling the protective functions offered by the cellular protein named RB, which serves as the brakes to stop cell division. Without functional brakes, the cell grows without restraint. Taken together, a virally infected cell loses the ability to commit suicide to prevent the spread of new viruses. Additionally, the infected cell divides uncontrollably which creates even more infected cells that grow without inhibition.

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The treatment options for HPV-induced cancers vary depending on the type and stage of the cancer at the time of diagnosis. The most common type of HPV-positive cancer for both men and women is oropharyngeal cancer and is usually treated with radiation therapy. Unfortunately, this treatment approach can cause collateral damage to healthy tissue that surrounds the cancer. This can impair the function of several important structures in the oral cavity such as the salivary glands. Often, a combination of radiation therapy and chemotherapy are employed to treat the cancer. The chemotherapy approach can involve cisplatin or paclitaxel which both target the cancer features of uncontrolled cell growth caused by the HPV protein E7, as described earlier. Interestingly, HPV-positive oropharyngeal cancers have a better prognosis and survival rate than HPV-negative cancers of the same kind. This is likely due to a better response to therapies used to treat the HPV-positive cancer. When considering only women, the most common HPV-positive cancer is cervical cancer which is typically treated with surgery following an early diagnosis and has a very high five-year survival rate. Routine screening for cervical cancer includes Pap tests which have been shown to be an effective deterrent for progressive HPV-positive cervical cancer.

Submit your **Cancer Answers** topics to info@CancerConsultantsOfAmerica.com

We Are Available to You

Please contact us today if you would like more information about how our services can benefit you and your family.

Services:

- Individual and Family Cancer Education
- Medical Appointment Liaison Services
- Information Seminars and Public Speaking Events

Fun Facts – August

Cancer Awareness Month:

- Appendix Cancer (Amber) 🧡

August 1 – International Beer Day 🍺

August 8 – International Cat Day 🐱

August 11-13 – Perseid Meteor Showers 🌠

August 12 – International Youth Day 🧒🧑🧒🧑

August 16 – World Honey Bee Day 🐝

August 26 – Women's Equality Day ♀=♂


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