

# HPV: HOW IS A SEXUALLY TRANSMITTED INFECTION RELATED TO CERVICAL CANCER?



by Elizabeth W. Hirsh, PA-C, MS

The media attention that accompanied FDA approval of the Gardasil® Vaccine in July 2006 contributed significantly to increasing the general public's knowledge and awareness about Human Papilloma Virus (HPV). But understanding the complex relationship between an abnormal pap smear result, HPV and cancer has been elusive and the cause of unnecessary anxiety.

Approximately 50 types of genital HPV exist that can be transmitted through simple skin to skin contact. Only two (Types 16 and 18) out of these 50 types are responsible for over 70% of eventual cervical cancer and another two (Types 6 and 11) are responsible for over 90% of external genital warts. Most people (estimated to be approximately one out of every three) do not have any signs, symptoms or evidence of infection. The virus is transmissible when it is actively replicating, but activation may occur at any time, even many many years later. Most people acquire a mixture of various types of HPV, but usually only one or two types activate at a time. There is not any cross-over protection from one type to another type. Currently, available testing only identifies actively replicating HPV DNA types. Therefore, a negative HPV DNA test or normal pap smear result does not mean HPV viral types are not "inresidence" and available to become active.

HPV becomes detectable when it begins to reproduce within your cells. For the majority of healthy women, their immune systems will succeed in making the HPV DNA stop reproducing. Once it is suppressed, the cells can repair

themselves and become normal again. This can take approximately six to 18 months. In rare circumstances, an immune system does not succeed in suppressing the virus, which proceeds to destroy the cells where it lives. This is how an infection can end up creating cancerous cells.

For many years, women have been told that a pap smear is a screen for cervical cancer. While true, it is misleading because it implies that an abnormal result means cancer. In fact, most abnormal pap smears reflect evidence of infection, not cancer. The goal of annual pap smear screening, testing and treatment of abnormal results is really to identify women with persistent HPV so there is no opportunity for progression to cancer.

## HOW DOES THE NEW GARDASIL® VACCINE FIT INTO THIS PICTURE?

Gardasil® contains four types of "virus-like particles (VLP)" that do not contain any DNA but are identical on the outside to HPV types 16, 18, 6 and 11. When a woman is vaccinated, the VLPs stimulate the immune system to produce antibodies. If the woman is later exposed to HPV types 6, 11, 16 and/or 18, they cannot get into any cells and are eliminated by the immune system. The vaccine works best when there has never been any exposure to HPV because all four VLP types are able to

block infection. Based on research, even women with a prior history of HPV, have probably not acquired HPV types 6, 11, 16 and 18, therefore "catch up" vaccination is recommended. Vaccination, however, does not eliminate the need for regular pap smear testing and pelvic examinations because other HPV types may cause cellular abnormalities and potentially cancer.

Once researchers discovered HPV was responsible for cervical cancer, they began to look at other cancers and other viruses. HPV types have been identified as present in some rectal, throat and neck cancers in both sexes. High-risk HPV also appears to be stimulated by the carcinogens associated with tobacco use. Studies are now focused on documenting the efficacy of preventing high-risk HPV type infection in males and women older than 26 years through vaccination. Review by the FDA for expanded vaccination may occur as soon as 2010. 

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