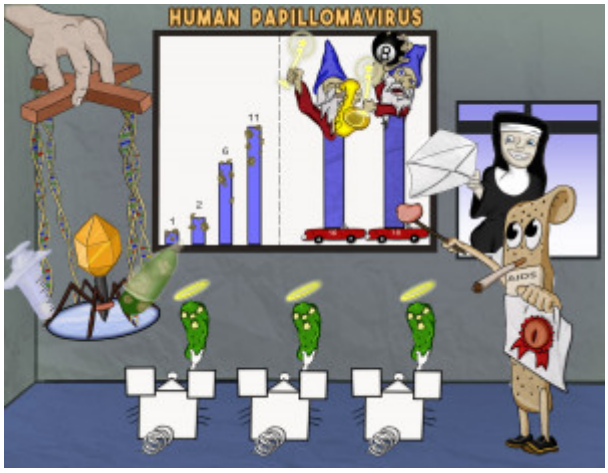
Human Papillomavirus (HPV)

Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States. The papillomavirus is a non-enveloped circular double-stranded DNA virus and has numerous strains. HPV types 6 and 11 are associated with condyloma acuminata (genital warts) that are spread via direct skin-to-skin contact. HPV types 16 and 18 are high-risk strains that are linked to squamous neoplasia of the anogenital region, especially cervical and penile carcinoma, as well as head and neck cancer. Women who smoke are at an increased risk for high-grade cervical cancers with persistent high-risk HPV infections. Immunosuppression is associated with the presence of high-risk HPV types, such as HPV types 16 and 18. HPV causes squamous epithelium to undergo structural changes to become koilocytes. Koilocytes form over time where the nucleus undergoes irreversible chromatin condensation (pyknosis) and becomes darker (hyperchromasia), the nuclear membrane becomes irregular in shape, and a clear area develops around the nucleus (perinuclear halo). Koilocytes are found in premalignant lesions of the cervix, penis and oropharynx. There is an HPV vaccine available for young adolescents and adults to help build immunity against high-risk HPV strains and prevent malignancies.



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Characteristics

Non-enveloped
Nun-envelope
Papillomavirus is a non-enveloped virus, also called a naked virus. Many viruses have envelopes, which are outer membranes that cover their protein capsids that help to enter host cells. However because papilloma viruses are nonenveloped, their capsids are responsible for attaching to host cells.

Circular
Circular-object
Papilloma virus has DNA in a circular arrangement as opposed to a linear formation.

Double Stranded DNA
DNA Double-helix
Papillomavirus is a DNA virus, meaning its genetic code consists of deoxyribonucleic acid as opposed to ribonucleic acid. Papillomavirus is a double stranded DNA virus. Most DNA viruses are double stranded with the exception of parvovirus.

Disease

Warts 1, 2, 6, 11
Wart graph 1, 2, 6, 11
HPV types 1 and 2 cause common skin warts, such as plantar warts. HPV types 6 and 11 are the most common cause of genital warts, also known as condylomata acuminata.

Condyloma acuminata
Condom Cucumber
Condylomata acuminata, also known as venereal warts, are genital warts that are most commonly caused by human papillomavirus (HPV) types 6 and 11. They are highly contagious through direct skin-to-skin contact.

Type 16, 18
(1) Wand (6) Sax, (1) Wand (8) Ball
HPV types 16 and 18 are associated with squamous neoplasia of the anogenital region, including the cervix and penis, as well as the oropharynx.

Cervical Carcinoma
Cervix-certificate Car-gnome
High risk strains of HPV are linked to anogenital cancers, especially cervical and penile carcinoma, as well as head and neck cancers. Malignant lesions caused by HPV have consistently expressed viral oncogenes E6 and E7 which alter proteins that regulate growth.

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Penile Carcinoma

Penis pointer

High risk strains of HPV are linked to anogenital cancers, especially cervical and penile carcinoma, as well as head and neck cancers. Malignant lesions caused by HPV have consistently expressed viral oncogenes E6 and E7 which alter proteins that regulate growth.

AIDS/Immunocompromised

Band-AIDS

Immunosuppression is associated with the presence of high-risk HPV types, such as HPV types 16 and 18. This may be related to the lack of defense by mucosal tissues which therefore allows HPV to cause malignant changes. This puts patients with AIDS, organ transplants and other immunosuppressed individuals at risk.

Worsened by Smoking

Cigarette

Women who smoke are more likely to have persistent high-risk HPV infections and are more likely to develop high grade cervical cancers than non-smokers.

Diagnosis

Koilocytic change in squamous epithelium

Coil on Square-mouse

HPV causes squamous epithelium to undergo structural changes to become koilocytes. Over time the nucleus enlarges and becomes darker (hyperchromasia), the nuclear membrane becomes irregular in shape, and a clear area develops around the nucleus (perinuclear halo). Koilocytes are found in premalignant lesions of the cervix, penis and oropharynx.

Pyknotic Nuclei Surrounded by Clear Halo

Nuclear Pickle with Halo

Pyknosis is the irreversible condensation of chromatin in the nucleus of a cell undergoing apoptosis or necrosis. Pyknosis is found in squamous epithelial cells affected by HPV and is recognized by the clear halo that develops around the nucleus, also known as a perinuclear halo.

Treatment

Vaccine Available

Syringe

The Human Papillomavirus (HPV) vaccine is for young adolescents and adults to help build immunity against high-risk HPV strains, which can lead to premalignant lesions of the cervix, penis and oropharynx.

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