

# Sex and Gender Differences

## HUMAN PAPILLOMA VIRUS INFECTION



Human Papilloma Virus (HPV) is a group of over 200 related viruses and is the most common sexually transmitted infection (STI) in the United States.

	FEMALE	ALL	MALE
Risk Factors	<ul style="list-style-type: none"><li>Increased # of pregnancies</li><li><b>54%</b> of females in the US are vaccinated against HPV</li><li>Women who have sex with women can contract HPV from male or female partners</li></ul>	<ul style="list-style-type: none"><li>Genetics</li><li>Tobacco use</li><li>Younger age at first sexual encounter</li><li>Greater # of sexual partners</li><li>Presence of other STIs</li><li>Absence of vaccination against HPV</li><li>Anal sex</li><li>Oral sex</li></ul>	<ul style="list-style-type: none"><li>Being uncircumcised</li><li>Inconsistent condom use</li><li>Higher alcohol intake</li><li><b>49%</b> of males in the US are vaccinated against HPV</li><li>Higher incidence in men who have sex with men</li></ul>
Prevalence	<ul style="list-style-type: none"><li><b>Higher prevalence in females</b> due to vulnerable cervical cells at the transformation zone</li><li>80% of cases occur in countries with limited health resources</li></ul>	<ul style="list-style-type: none"><li>Over 80% of people will contract HPV by 45</li><li>Cause of<ul style="list-style-type: none"><li>5% of cancers worldwide</li><li>70% of oropharyngeal cancers</li><li>4th highest # of cancer related deaths in the US</li><li>3rd highest # of cancer deaths worldwide</li></ul></li></ul>	<ul style="list-style-type: none"><li>1 in 3 men (ages 15+) worldwide carry the HPV virus<ul style="list-style-type: none"><li>1 in 5 carry high risk types</li></ul></li><li>64% of men who have sex with men have HPV</li><li>42% of men become infected between the ages of 14-59</li></ul>
Prevention	<ul style="list-style-type: none"><li>Female Condom</li></ul>	<ul style="list-style-type: none"><li>Barrier Contraception</li><li>Dental Dams</li><li>Vaccination: Approved for ages 9-45</li></ul>	<ul style="list-style-type: none"><li>Male Condom</li></ul>
Presentation	<ul style="list-style-type: none"><li>Vulvar cancer</li><li>Vaginal cancer</li><li>Cervical cancer</li></ul>	<ul style="list-style-type: none"><li>Generally asymptomatic</li><li>May present as:<ul style="list-style-type: none"><li>Genital and non-genital warts</li><li>Other cutaneous infections</li><li>Anal cancer</li><li>Oropharyngeal cancer</li><li>Recurrent respiratory papillomatosis in newborns</li></ul></li></ul>	<ul style="list-style-type: none"><li>Penile cancer</li><li>Oropharyngeal cancer: Most common HPV-related cancer<ul style="list-style-type: none"><li><b>3x more likely than women</b> to develop oropharyngeal cancer</li></ul></li><li>2x more likely than HPV-negative men to have prostate cancer</li></ul>
Pathophysiology	<ul style="list-style-type: none"><li>Cervical intraepithelial neoplasia</li><li>High affinity for cervical transformation zone</li><li>HPV 16 and 18 are the cause of <b>99% of cervical cancer</b></li><li>HPV can be <b>transmitted vertically</b> from mother to newborn</li><li>80-90% of HPV infections will spontaneously resolve<ul style="list-style-type: none"><li>The remaining 10-20% need continued screening</li></ul></li></ul>	<ul style="list-style-type: none"><li>Transmission: Skin-to-skin, genital, fomites</li><li>200 HPV genotypes identified<ul style="list-style-type: none"><li>12 are carcinogenic, high risk strains (hrHPV) <b>16, 18</b>, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59</li><li>Low risk strains cause genital warts</li></ul></li><li>hrHPV produce E6 &amp;E7 proteins which destroy tumor suppressor proteins (p53 and RB)</li><li>Transformation to from HPV infection to cancer takes 10-20 years in the non-immunocompromised</li></ul>	<ul style="list-style-type: none"><li>Penile intraepithelial neoplasia</li></ul>
Diagnostics/Screening	<ul style="list-style-type: none"><li><b>All people with a cervix require screening</b></li><li>Recommended: <b>first pap at 21 years old</b></li><li>HPV testing<ul style="list-style-type: none"><li>Co-testing: Both pap smear &amp; HPV testing</li><li>Reflex testing: Pap smear only if HPV positive</li></ul></li><li>FDA-approved <b>at-home</b> cervical screening test</li></ul>	<ul style="list-style-type: none"><li>There is <b>commercially available oral HPV testing</b></li><li>No approved screening tests yet for oropharyngeal or anal cancer<ul style="list-style-type: none"><li>Anal pap smears or anoscopy are sometimes performed “off label”</li></ul></li></ul>	<ul style="list-style-type: none"><li>No screening approved specifically for individuals with a penis</li></ul>
Treatment	<ul style="list-style-type: none"><li>For cervical cancer:<ul style="list-style-type: none"><li>Cervical LEEP procedure for carcinoma-in-situ of cervix</li><li>Radical hysterectomy for higher stage cancer of cervix</li><li>Radiation therapy</li></ul></li><li>Survival rates for HPV-related cancers:<ul style="list-style-type: none"><li>64% survive cervical cancer</li><li>53% survive vaginal squamous cell cancer</li><li>66% survive vulvar cancer</li></ul></li></ul>	<ul style="list-style-type: none"><li><b>No current treatment available for HPV infection</b></li><li>90% of cases resolve within 2 years</li><li>Wart treatment: excision, laser, cryotherapy, topical keratolytic agents</li><li>Cancer treatment: surgery, chemotherapy, and/or radiation</li><li>Survival rates for HPV-related cancers:<ul style="list-style-type: none"><li>51% survive oropharyngeal cancer</li><li>66% survive anal cancer</li><li>56% survive rectal cancer</li></ul></li></ul>	<ul style="list-style-type: none"><li>Survival rates for HPV- related penile cancer:<ul style="list-style-type: none"><li>80% survive if localized</li><li>50% survive if local spread</li><li>9% survive if distant spread</li></ul></li></ul>