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HPV

Peggy J. Parks

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Foreword

“Where is the knowledge we have lost in information?”

—T.S. Eliot, “The Rock.”

As modern civilization continues to evolve, its ability to create, store, distribute, and access information expands exponentially. The explosion of information from all media continues to increase at a phenomenal rate. By 2020 some experts predict the worldwide information base will double every seventy-three days. While access to diverse sources of information and perspectives is paramount to any democratic society, information alone cannot help people gain knowledge and understanding. Information must be organized and presented clearly and succinctly in order to be understood. The challenge in the digital age becomes not the creation of information, but how best to sort, organize, enhance, and present information.

ReferencePoint Press developed the *Compact Research* series with this challenge of the information age in mind. More than any other subject area today, researching current issues can yield vast, diverse, and unqualified information that can be intimidating and overwhelming for even the most advanced and motivated researcher. The *Compact Research* series offers a compact, relevant, intelligent, and conveniently organized collection of information covering a variety of current topics ranging from illegal immigration and deforestation to diseases such as anorexia and meningitis.

The series focuses on three types of information: objective single-author narratives, opinion-based primary source quotations, and facts

and statistics. The clearly written objective narratives provide context and reliable background information. Primary source quotes are carefully selected and cited, exposing the reader to differing points of view, and facts and statistics sections aid the reader in evaluating perspectives. Presenting these key types of information creates a richer, more balanced learning experience.

For better understanding and convenience, the series enhances information by organizing it into narrower topics and adding design features that make it easy for a reader to identify desired content. For example, in *Compact Research: Illegal Immigration*, a chapter covering the economic impact of illegal immigration has an objective narrative explaining the various ways the economy is impacted, a balanced section of numerous primary source quotes on the topic, followed by facts and full-color illustrations to encourage evaluation of contrasting perspectives.

The ancient Roman philosopher Lucius Annaeus Seneca wrote, “It is quality rather than quantity that matters.” More than just a collection of content, the *Compact Research* series is simply committed to creating, finding, organizing, and presenting the most relevant and appropriate amount of information on a current topic in a user-friendly style that invites, intrigues, and fosters understanding.

HPV at a Glance

HPV Defined

Human papillomavirus (HPV) is a large family of viruses; thirty to forty of them can infect the genital area of males and females and are considered sexually transmitted diseases (STDs).

HPV Types

Scientists categorize HPVs into two groups: low risk (wart causing) and high risk (cancer causing).

HPV Infection

Unlike many other viruses, HPVs infect only skin cells; these may be cutaneous (visible) skin or the skin of the body's warm, moist, mucous membranes.

Genital HPV Prevalence

According to the Centers for Disease Control and Prevention (CDC), HPV is the most common of all STDs, with an estimated 79 million cases currently affecting males and females in the United States.

Transmission of HPV

Genital HPVs are spread most often through sexual intercourse, but may also be spread through oral sex or any type of skin-to-skin contact with infected genital areas.

Health Risks

High-risk HPVs are associated with numerous types of cancer, the most common of which is cervical cancer.

Symptoms of Infection

Certain HPV strains cause genital warts, so symptoms are obvious; high-risk strains often cause no symptoms and are discovered only when problems develop, such as the onset of cancer.

Factors That Increase Risk

Anyone who is sexually active is at risk for HPV infection, but risk is highest for those with multiple sex partners and those with impaired immune systems.

Diagnosis

Two tests, the Pap smear and HPV DNA test, are used to detect abnormal cells and/or HPV infection in women, but there is no test for men.

Treatment

HPV infection is incurable, but people can undergo treatments for many of the health problems associated with it.

Prevention

Preventing HPV infection is challenging, since even touching someone's genitals can spread it. Vaccinations can protect against HPVs that cause most cases of genital warts, cervical cancer, and several other types of cancers.

HPV Vaccine Controversy

Mandating HPV vaccination is an extremely controversial prospect; many states and territories have other types of HPV legislation in place, but only in Virginia and Washington, DC, is the vaccine mandatory.

Overview

“Human papillomavirus (HPV) is the most common sexually transmitted virus in the US.”

—American Academy of Pediatrics, an organization that is committed to the health and well-being of infants, children, adolescents, and young adults.

“Human papillomavirus infection and HPV-associated cancers pose a major public health threat.”

—Lawrence O. Gostin, an attorney with the O’Neill Institute for National and Global Health Law who specializes in public health law.

In October 2012 a college student posted an article online about her struggle with a sexually transmitted virus known as HPV. She explains how her nightmare began the day her boyfriend called to tell her that he was infected. After discovering a small white bump on his penis, he had gone to a doctor, who confirmed that it was a genital wart—a symptom of HPV infection, which he had likely passed along to her. At first she was so taken aback by what he said that she thought he was playing a joke on her. “My boyfriend told me he (now we) had genital warts,” she says. “I laughed for thirty seconds until I realized he wasn’t joking.” She became terribly distraught, and grew even more so when she, too, developed genital warts and had to have them surgically removed. “I felt dirty, infected, and terrified,”¹ she says.

Working Through the Angst

The woman was furious with her boyfriend for infecting her, and for weeks she could barely stand to look at him. Then she began to realize

that he was also having a difficult time. “My boyfriend was a wreck,” she says. “He felt ashamed, responsible, and incredibly guilty.”² They decided to spend time researching HPV in order to learn as much as they could about it, and the first thing they discovered was that it was the most common of all STDs. Even on their own college campus, one out of every three students was assumed to be infected with the virus.

Hearing those statistics was somewhat comforting, but the woman still felt a great deal of shame. Eight or nine months passed before she could look at herself in the mirror without feeling disgusted, and even more time passed before she regained her self-esteem. “It took me two years to realize I wasn’t dirty,” she says. Through reading online discussions about HPV, talking openly with her boyfriend, and confiding in a few trusted friends, she finally stopped viewing herself in such a negative light. “Sexually transmitted infections should be treated just like other infections,” she says, “with medical attention and care and not with judgement, stigma, and self-loathing.”³

What Is HPV?

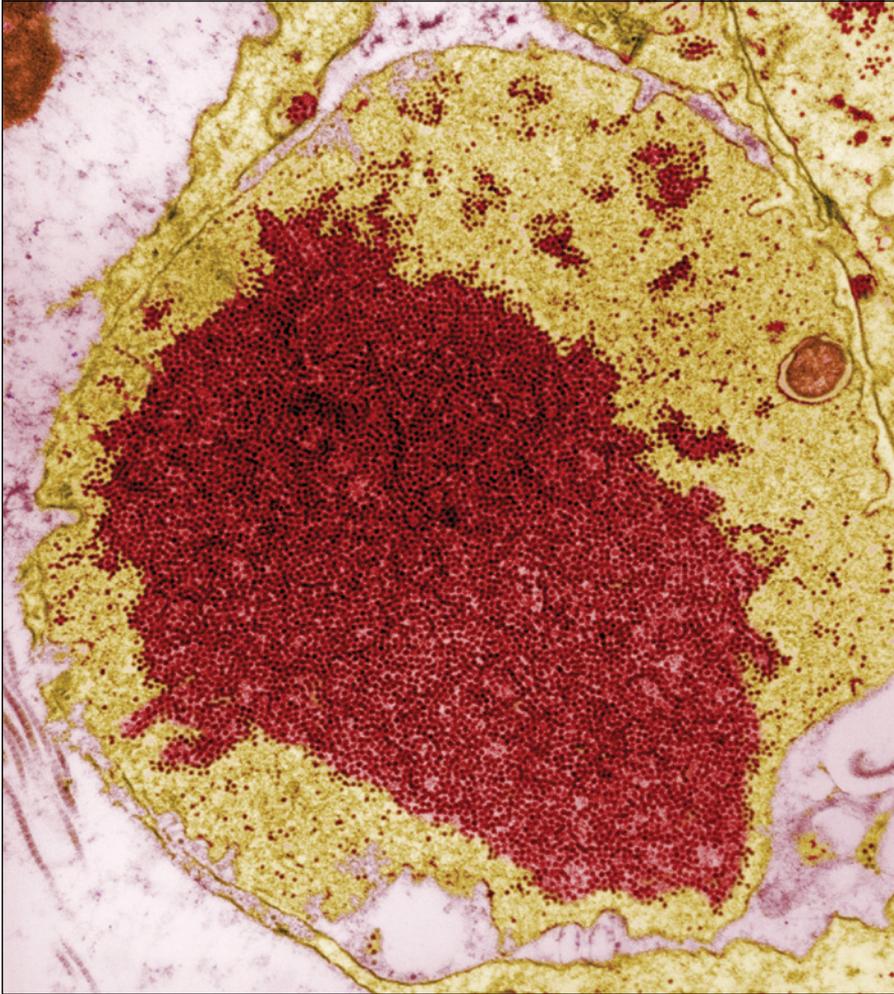
Although *human papillomavirus* sounds like a singular term, HPV is actually a large family of viruses. Scientists have discovered an estimated 180 HPV types, or strains, each of which has its own unique DNA structure. These strains are all identified by numbers and are loosely categorized into two groups: low-risk (wart-causing) types and high-risk (cancer-causing) types, based on whether they put someone at risk for cancer. “Low-risk HPV types can cause genital warts and low-grade changes in the cells, but rarely cause cancer,” says the American Cancer Society. “High-risk HPV types can cause low-grade changes, high-grade changes, pre-cancer, and cancer.”⁴

“

Although *human papillomavirus* sounds like a singular term, HPV is actually a large family of viruses.

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Most of the known HPV strains can cause papillomas (the scientific term for “warts”), which can grow on the skin of the hands, arms, chest, feet, and toes. Thirty to forty HPVs can infect the genital areas of males and females, as well as the lining of the mouth and throat.



Hundreds of HPV particles (red) infect a host cell, as seen through a colored transmission electron micrograph. High-risk strains of the virus have been linked to cervical cancer.

Like all viruses, those in the HPV family are microscopic organisms that are not capable of reproducing on their own. Rather, they must seek out and invade living cells as hosts and then hijack the cells' reproductive machinery to make more viruses. One trait that distinguishes HPVs from other viruses is the kinds of cells they attack, as the American Cancer Society explains: "For example, cold and flu viruses find and invade cells that line the respiratory tract (nose, sinuses, breathing tubes, and lungs).

The human immunodeficiency virus (HIV) infects the T-cells and macrophages of the immune system. HPV infects *squamous epithelial cells*.⁵ Squamous epithelial cells are thin, flat cells that cover the skin's surface and are also found in mucous membranes. These are the warm, moist, skin-like layers that line the inside of the mouth, as well as the vagina, anus, cervix (base of the womb at the top of the vagina), vulva (around the outside of the vagina), head of the penis, mouth, throat, trachea (the main breathing tube), bronchi (smaller breathing tubes branching off the trachea), and lungs.

How HPV Is Spread

HPVs are highly contagious viruses. Common warts, for instance, easily spread when someone with breaks in the skin (even microscopic cuts) touches an object used by an infected person. This allows the virus to enter the person's body. Although people of all ages can contract and spread warts, they are especially common among children. A widely accepted theory is that children commonly suffer from scrapes, cuts, and hangnails. If they are exposed to HPV, these breaks in the skin provide an ideal way for the virus to enter their bodies.

Mucosal HPVs can spread in a number of ways, most commonly through vaginal or anal sex. They can also spread during oral sex, as well as through skin-to-skin contact—even without sexual intercourse, as the Throat Cancer Foundation writes: “The virus lives in the skin and spreads via skin to skin contact.” The group says this differentiates HPVs from other STDs like chlamydia and HIV, both of which are spread through bodily fluids. “This means you can contract HPV through things like vaginal and anal sex, oral sex, mutual masturbation—anything where infected skin touches skin (it is important to remember your skin is not just on the outside). There just needs to be tiny microscopic cuts for HPV to be transferred from person to person.”⁶

Prevalence of Genital HPV

HPV is the most common of all STDs, and it also accounts for the majority of newly acquired STDs. “Anyone who is having . . . sex can get HPV,” says the CDC, adding that nearly all sexually active men and women contract the virus at some point in their lives. The agency goes on to say: “This is true even for people who only have sex with one person in their

lifetime.”⁷ The World Health Organization estimates that HPV affects more than 630 million people worldwide. In the United States, out of more than 110 million STDs affecting men and women, HPV accounts for approximately 79 million—nearly 72 percent of the total.

CDC research has also shown that the majority of new HPV infections are among youth. Although males and females of any age can contract HPV, infections are growing in prevalence among adolescents and young adults aged fifteen to twenty-four. In a June 2012 paper, researchers from New York City write: “This phenomenon is often attributed to both an earlier age of initial sexual contact as well as an increase in the total number of sexual partners.”⁸

What Are the Health Risks of HPV?

In most people who are infected with HPV, the immune system gets rid of the virus, as San Francisco physician Robin Wallace explains: “HPV is a tough virus, but our immune systems are usually tougher. Our bodies start fighting off the virus immediately.”⁹ Sometimes, however, the immune system cannot rid the body of HPV, which can lead to cell changes that develop into cancer. Nearly 100 percent of cervical cancer cases

are caused by infection with certain high-risk HPV strains, and the disease is the third leading cause of cancer death among women worldwide. Each year more than 240,000 women worldwide die of cervical cancer, with most from developing countries where diagnostic tests are often not available. In the United States cervical cancer is the most common form of HPV-related cancer. It affects an estimated 19,000

women each year and results in nearly four thousand deaths.

High-risk HPV strains are also associated with other types of cancer. Among women, according to the CDC, HPV causes 2,800 cancers of the anus, 2,100 cancers of the vulva, and 500 cancers of the vagina each year. Among men, 600 penile cancers and 1,500 anal cancers are attributed to HPV infection each year. Another growing problem is HPV-related oral

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[Genital HPV] can also spread during oral sex, as well as through skin-to-skin contact—even without sexual intercourse.

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cancer, whose prevalence has been on the rise. The CDC reports that nearly 12,000 new cases of HPV-associated oral cancers are diagnosed each year in the United States, including 2,370 in women and 9,356 in men.

HPV Warning Signs

The majority of people with HPV never develop any symptoms, which means they have no way of knowing they are infected. Says Stefanie Gefroh-Ellison, a physician from Fargo, North Dakota: “Only about 20 percent of people who have it will ever know they have it.”¹⁰ When symptoms do develop it is undoubtedly because the person has contracted one of the HPV strains that causes warts. Genital warts, for instance, often appear within a few months after contact with an infected partner. They may range in size from small to large and appear as red or white bumps, tiny cauliflower-like clusters, or flat flesh-colored bumps that are barely visible. In women genital warts may grow on the lips of the vulva, around the clitoris, in and around the anus, and on the linings of the vagina, cervix, and rectum. In men genital warts tend to develop on the tip and shaft of the penis and on the scrotum, as well as in and around the anus.

Strains of HPV that do not cause warts are even less likely to cause symptoms, as Philadelphia, Pennsylvania, physician Marie Savard explains: “Occasionally, people may notice itching or skin changes, but more often HPV is a silent infection.”¹¹ HPV may linger in the body for many years and remain undetected. Over time, however, if cells in infected areas become abnormal and then turn cancerous, warning signs of cancer could begin to appear. Depending on the type and severity (how aggressive the cancer is), these could include anything from severe pain to abnormal bleeding and/or the development of tumors.

“The majority of people with HPV never develop any symptoms, which means they have no way of knowing they are infected.”

Who Is at Risk for HPV Infection?

Although anyone who is sexually active can contract HPV, certain factors can markedly increase someone’s risk. One of the main risk factors is be-