



Human Papillomavirus in Wyoming

BY ALEXIA HARRIST, MD, PHD, FAAP



My thrill at being asked to contribute to Wyoming Medicine was quickly followed by the difficult process of choosing a topic. As State Health Officer and State Epidemiologist at the Wyoming Department of Health (WDH) I have the privilege of working on many health issues that impact the lives of Wyoming residents, all of which deserve dedicated attention. To that end, I chose a topic that I am particularly passionate about, and that touches multiple elements of public health and preventive medicine – from cancer screening to vaccination to sexual health education. It's something for which the public health and medical communities have the tools we need to prevent disease – all that is left for us is to work together to implement them to their full capacity.

That topic is Human Papillomavirus (HPV). HPV is a group of over 150 related viruses that are transmitted through intimate skin-to-skin contact. The Centers for Disease Control and Prevention (CDC) estimates that 80% of Americans will be infected with HPV in their lifetime, and that at any given time nearly 80 million adolescents and adults are infected – that is one out of every four people. While 90% of HPV infections are cleared by the immune system without adverse health effects, infection can lead to the development of anogenital warts and cancer. HPV is responsible for more than 90% of cervical and anal cancers, 70% of vaginal and vulvar cancers, 60% of penile cancers, and 70% of oropharyngeal cancers in the United States.

In Wyoming, there are an average of 65 new cases of cancer diagnosed per year in anatomic sites where HPV is found; the most common site is the oropharynx (~29 cases/year) followed by the cervix (~21 cases/year). Screening for cervical cancer among women ages 21-65 years reduces cervical cancer incidence and mortality. However, cervical cancer screening rates among Wyoming women are low. Data from the Wyoming Behavioral Risk Factor Surveillance System indicate that in 2016 only 73.2% of Wyoming women ages 21-65 years received a pap test in the past three years, significantly lower than the average U.S. rate of 79.8% and placing us tied for the lowest rate among reporting states. There are currently no recommended screening protocols for the early detection of oropharyngeal, anal, vaginal, vulvar, or penile cancers.

But the good news, of course, is that we have a vaccine. The HPV vaccine, first licensed in 2006, followed the Hepatitis B vaccine as the second that provides primary cancer prevention. The vaccine consists of recombinant HPV capsid proteins that form virus-like particles that are non-infectious, non-oncogenic, and stimulate higher levels of neutralizing antibody

than natural infection. The 9-valent vaccine currently in use in the United States protects against infection with the two HPV subtypes most commonly associated with anogenital warts (types 6 and 11), the two high-risk HPV subtypes associated with over 60% of HPV-associated cancers (types 16 and 18), and five HPV subtypes associated with another 10% of HPV-associated cancers (types 31, 33, 45, 52, and 58). HPV vaccine is recommended by the Advisory Committee on Immunization Practices for both males and females as a two-dose series beginning at age 11-12 years; those who begin the vaccine series at 15 years or older and those who are immunocompromised require three doses.

WYOMING
EHDI
Early Hearing Detection and Intervention

Annual hearing screenings help ensure sound beginnings for children.

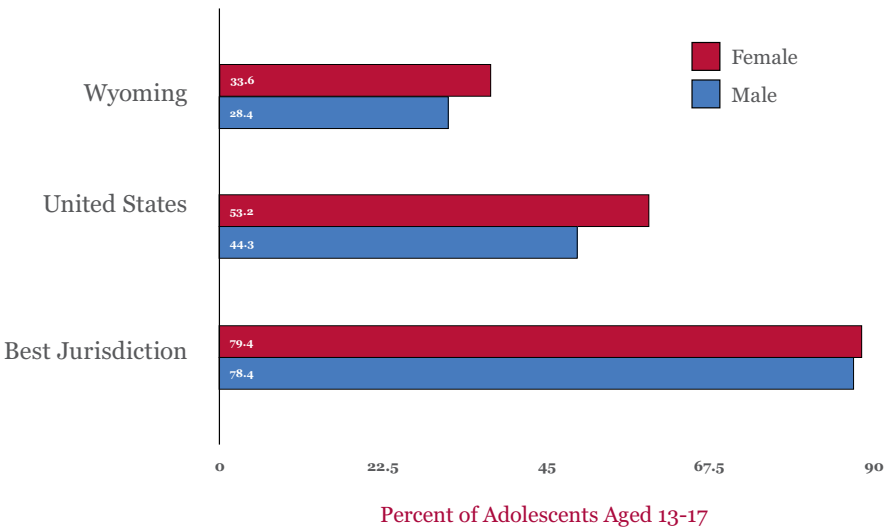
Visit www.wyomingehdi.org for more information.

Despite the high degree of efficacy and safety shown by HPV vaccines in clinical trials and post-licensure studies, vaccine uptake has been slow compared to other vaccines. Here in Wyoming, HPV vaccine coverage among our adolescents is consistently among the lowest in the United States. According to the 2017 National Immunization Survey-Teen, the percentage of Wyoming adolescents who are up-to-date for HPV vaccination was only 33.6% among females and 28.4% among males aged 13-17 years, which is the lowest and third lowest, respectively, among reporting jurisdictions. Up-to-date vaccine coverage in Wyoming is significantly below that of the United States average and, shockingly, less than half that of the jurisdictions with the best coverage (see Figure 1).

Why is uptake so low? I imagine that those of you who see adolescent patients can name many of the reasons. Studies indicate that barriers include those that apply to other vaccines – the cost of the vaccine, inconsistent preventive care visits, the need for multiple visits to complete the series, and concerns about vaccine safety. Some barriers, however, are specific to the HPV vaccine, including parental concerns about the potential effects on sexual activity, lack of understanding about how common HPV is and risk for infection, perceptions that the HPV vaccine doesn't directly benefit boys, and questions about why the vaccine needs to be given at such young age. The stigma that surrounds the discussion of sexually transmitted diseases can be a barrier to both providers and parents, despite the fact that the ultimate benefit of the vaccine is cancer prevention.

These studies also consistently show, however, that a strong recommendation from a health care provider is the single best predictor of whether parents choose to vaccinate their adolescents against HPV-associated cancers. A strong recommendation includes recommending the HPV vaccine on the same day and in the same way that the Tdap and meningococcal vaccines are offered. It includes being able to respond to parental concerns about vaccine safety (there have been no associated serious side effects), about the timing of the vaccine (HPV vaccination is recommended before the onset of sexual activity, in the same way we recommend a bike helmet is put on before starting to ride), about the effects on sexual activity (multiple studies have shown that the HPV vaccine does not make adolescents more likely to be sexually active or start having sex at a younger age), and about not having a direct benefit for boys (the HPV vaccine protects against infections that can lead to anal, penile, and oropharyngeal cancers.) The CDC has developed evidence-based guidance for healthcare providers on speaking with patients about the HPV vaccine (<https://www.cdc.gov/hpv/hcp/index.html>).

Figure 1: Percent of Adolescents Aged 3-17 Years Who Are Up-To-Date on HPV Vaccination, by Sex, 2017



WDH has several ongoing activities dedicated to increasing the rates of HPV vaccination in Wyoming. During quality improvement site visits with public vaccine providers, the Immunization Unit presents clinic HPV coverage rates and provides technical assistance on improving rates. The Immunization Unit will also be hosting two provider education days in Casper and Cheyenne in June, 2019 with Dr. Gary Marshall to provide education on addressing vaccine hesitancy. The Wyoming Cancer Program dedicated its January 2019 Wyoming Cancer Coalition meeting to education about HPV and strategies to improve vaccination and screening rates. The Cancer Coalition has also developed an HPV workgroup to further discuss ways to improve HPV vaccination in the state. These activities are in addition to our regular activities that address immunization, cancer screening, and sexual health, including our public vaccine programs, The Wyoming Breast and Cervical Cancer Screening Program, and the Wyoming Personal Responsibility and Education Program (WyPREP), which provides evidence-based teen pregnancy and sexually transmitted disease prevention services in schools and community settings.

As a new attending pediatrician working in an emergency department 5 years ago, I became interested in and ultimately chose to go into public health so that I could try to prevent as many children as possible from ever needing to come see me. Even if one Wyoming child never has to receive a diagnosis of cancer because of this vaccine, that would be a great achievement – but the data show it can be many more than one. HPV vaccination is one of many powerful examples of how public health and health care providers, working together, can improve the health of both individuals and our community. 