Human papillomavirus (HPV) is the most common sexually transmitted infection and is a leading etiology for cancer. The Advisory Committee on Immunization Practices (ACIP) recommends routine vaccination of males and females aged 11–26 years. Studies suggest that U.S. military service members have higher HPV incidence rates and lower vaccination rates compared to the national average. Although the U.S. military enforces many recommended vaccines, the HPV vaccine fails to make the list.

**AT A GLANCE**

- Military healthcare leaders and policymakers can use research findings and evidence-based practice to increase HPV vaccine compliance among their beneficiaries.
- HPV vaccine uptake strategies include policy reform, process guidelines, educational strategies, and mandates.
- An updated U.S. military policy could include the most recent ACIP guidelines on the HPV vaccine and provide guidance about increased avenues for vaccine availability to service members.

**KEYWORDS**

human papillomavirus; vaccination; United States military service members

**DIGITAL OBJECT IDENTIFIER**

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Human papillomavirus (HPV) is the most prevalent sexually transmitted infection (STI), with an estimated 14 million new cases each year and 79 million Americans infected with the virus (Centers for Disease Control and Prevention [CDC], 2016b). HPV can be transmitted via anal, oral, and vaginal intercourse (CDC, 2016b). Some types of HPV infections may cause lesions that, over a period of time, and if left untreated, may develop into cancer. HPV accounts for 5% of cancers, contributing to 90% of anal, 70% of cervical, 40% of vulvar, vaginal, and penile, 30% of laryngeal, and 12% of oral and pharyngeal cancers (CDC, 2015).

However, an HPV vaccine, Gardasil 9®, has been developed that protects against HPV infection. The Advisory Committee on Immunization Practices (ACIP) recommends the routine HPV vaccination of people aged 11–26 years (Markowitz et al., 2014). Although the HPV vaccine is covered by TRICARE, the healthcare program for the U.S. armed services, vaccine uptake is comparatively low among U.S. service members. For example, a study by Shen-Gunther, Shank, and Ta (2011) examined HPV vaccine adherence among TRICARE beneficiaries at Naval Medical Center San Diego. The study examined HPV vaccine uptake rates of 5,088 patients and discovered that the least-adherent group was active duty personnel. Because of the high HPV prevalence rates and low HPV vaccine uptake rates, there is an urgent need for military medicine to create healthcare policies that reflect the current HPV vaccine recommendations by the ACIP.

**Human Papillomavirus Incidence and Vaccine Uptake in the U.S. Military**

Studies show high STI prevalence in the U.S. military, and STIs are one of the leading reportable medical events (Goyal, Mattocks, & Sadler, 2012; Shah et al., 2001). Young people (aged 15–24 years) account for half of all new HPV cases (CDC, 2016a), and 42% of U.S. military personnel are aged 18-26 years (Defense Manpower Research, 2017). Higher HPV infection rates exist in the U.S. military than in civilian counterparts (Goyal et al., 2012; Masel et al., 2015). In a study of female Marine Corps recruits (N = 1,841) who were screened for chlamydia, gonorrhea, and trichomoniasis on entry to the military, 14% tested positive for an STI compared to 8% of similar-aged women in the general population (Boyer, Pollack, Becnel, & Shafer, 2008). Because most STIs have few symptoms and are not associated with severe morbidity or decreased combat capability, STIs are not viewed as military healthcare priorities (Goyal et al., 2012).

All U.S. service members are vaccinated against various diseases, starting with enlisted basic or officer accession training. Mandatory vaccines include, but are
not limited to, adenovirus, influenza, and meningococcal. New military accessions obtain the ACIP-recommended routine vaccinations if their immunization statuses are not up-to-date. The mandatory vaccines are directed to fight acute infections that have the potential to lead to epidemics and affect training and performance.

Although the U.S. military adheres to ACIP-recommended vaccines, the HPV vaccine fails to make the mandatory list. However, the U.S. military does recommend HPV vaccination. The U.S. Department of the Navy’s Bureau of Medicine and Surgery (BUMED) issued Note 6230, which supports HPV vaccine uptake. Note 6230 describes the 2011 ACIP HPV vaccine recommendations and encourages the vaccine to “be offered to both male and female service members at their first permanent duty station after their accession or training command” (BUMED, 2012, p. 2).

Vaccine Recommendations
Infections with low-risk HPV types are the major etiology for low-grade cervical cell changes and genital warts. High-risk HPV types are the etiology of HPV-related cancers. The HPV vaccine, Gardasil 9, is effective against nine of the low-risk and high-risk HPV types (U.S. Food and Drug Administration, 2017). The ACIP recommends routine HPV vaccination for boys and girls aged 11–12 years (Markowitz et al., 2014). The vaccine is also recommended for females aged 13–26 years and males aged 13–21 years who have not completed the series. The vaccine has been approved for administration in a three-dose series at 0, 1 or 2, and 6 months (Meites, Kempe, & Markowitz, 2016).

Strategies to Increase Vaccine Compliance in the U.S. Military
Several recommendations can be made from the literature to increase HPV vaccination coverage and reduce disease burden in the U.S. military. These recommendations include, but are not limited to, policies, process guidelines, educational strategies, and mandates (Bae, Ford, Shannon, & Huerta, 2017; Brandt, Pierce, & Crary, 2016; Groom et al., 2017).

The current BUMED HPV vaccine policy, dated December 2012, references the 2011 ACIP HPV vaccine recommendations (BUMED, 2012). These recommendations do not reflect the 2016 ACIP and CDC immunization practice guidelines (CDC, 2016c; Meites et al., 2016). An updated policy could encourage the HPV vaccine to be offered to members at their accession or training command and subsequent permanent duty stations. Many individuals receive their first dose of the HPV vaccine, but a smaller percentage receives the complete series (CDC, 2010). Full immunologic protection against the virus may not be achieved if service members do not receive their sequential HPV vaccines. Therefore, access and training to the vaccine fails to make the mandatory list.

Although the U.S. military adheres to other recommended vaccines, the HPV vaccine fails to make the mandatory list. In addition, mandatory HPV training for medical providers could include up-to-date information about ACIP HPV vaccine recommendations, vaccine safety and effectiveness, and communication strategies.

The U.S. military could require HPV vaccine uptake for all eligible candidates without appropriate exemptions. Standardized, mandatory HPV vaccination, similar to California’s AB2109 bill, could reduce any stigma associated with personnel receiving a vaccine that is associated with an STI (Mishra, 2010). California AB2109 requires parents exercising an exemption from immunization to provide a letter or affidavit signed by a healthcare practitioner that provides “information regarding the benefits and risks of the immunization and the health risks of specified communicable disease” (California Legislative Information, 2017, p. 1). All members who are candidates for the HPV vaccine could be screened and receive education on the vaccine per policy. After receiving counseling about the vaccine, members who have objections could be exempt from receiving the “required” HPV vaccine.

Policymakers and healthcare leaders could increase HPV vaccine uptake by maximizing access to HPV vaccination services and by reducing missed clinical opportunities to recommend and administer the HPV vaccine (National Vaccine Advisory Committee, 2015). For example, the use of walk-in immunization clinics could allow for increased HPV vaccine compliance. Some clinics require
a prescription or healthcare provider recommendation; therefore, members may not be able to take time off of work for an appointment because of their work schedules or may choose not to do so because of inconvenience. Clinics may have limited non-acute appointments for those seeking a prescription, which further delays follow-up vaccination. In addition, U.S. Navy vessels and forward-deployed units could be encouraged to maintain HPV vaccine supplies in their authorized medical allowance list (AMAL) to increase the availability of the vaccine to service members. Guidelines could encourage assessment and system-based changes using tools, such as provider and patient reminders, standing orders, and immunization information systems. Providers should review electronic health records for HPV vaccine compliance, and eligible candidates should be counseled regarding the potential benefits, limitations, and risks of HPV vaccination. The HPV vaccine could be discussed during routine visits, such as preventive health assessments. Immunization status could be examined when members enter into a new military command or have routine medical appointments.

Conclusion
Although HPV is a problem among the U.S. military, there are low HPV vaccine uptake rates among service members (Shen-Gunther et al., 2011). The ACIP recommends routine vaccination of people aged 11–26 years (Markowitz et al., 2014). Increased compliance with the ACIP HPV vaccine guidelines among U.S. service members could be improved through the following processes: the development of an updated HPV vaccine policy, HPV vaccine availability to all eligible members at accession or training commands and permanent duty stations, mandatory HPV vaccine inoculation for all eligible candidates without appropriate exemptions, the use of walk-in immunization clinics, maintenance of HPV vaccine supplies in AMALs, and implementation of process guidelines.

As a nurse practitioner, I have seen firsthand the devastating outcomes when U.S. military service members receive an incurable STI. I have gained profound insight into HPV vaccines through my programs of sexual health and immunization research. In addition, I have discovered that many service members can suffer physical and emotional effects related to HPV. The virus can have a major impact by decreasing manpower, readiness, and troop morale. Therefore, I strongly believe that there is an urgent need to create healthcare policies and prevention strategies that reflect the current ACIP HPV vaccine recommendations.

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REFERENCES


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