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NEW YORK STATE DEPARTMENT OF HEALTH AIDS INSTITUTE | HIV · HCV · SUBSTANCE USE · LGBT HEALTH

Prevention and Management of Human Papillomavirus Infection in Adults With HIV

Updates, Authorship, and Related Guidelines

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Highlights of changes, additions, and updates in the November 4, 2022 edition	• Updates have been made to the text throughout to align with the NYSDOH AI guidelines Screening for Cervical Dysplasia and Cancer in Adults With HIV and Screening for Anal Dysplasia and Cancer in Adults With HIV. • HPV Treatment section: The following recommendation was updated: "Clinicians should not use sinecatechins in patients with HIV. (A3)" • Table 1: Available Treatment Options for Anogenital Condyloma for Patients With HIV: Footnotes have been added indicating that podophyllin resin is no longer recommended because of the number of safer options available, and that treatments for neovaginal condyloma are the same as for intra-anal condyloma.
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Purpose of This Guideline

This guideline on human papillomavirus (HPV) in individuals with HIV was developed by the New York State Department of Health AIDS Institute (NYSDOH AI) to inform primary care providers and other practitioners in New York State about HPV prevention, screening methods, diagnosis and presentation, and treatment in adults with HIV. This guideline aims to achieve the following goals:

- Increase the number of New York State residents with HIV who are screened and effectively treated for HPV-related dysplasia.
- Support the NYSDOH Prevention Agenda 2019-2024 by educating care providers on the importance of HPV vaccination and increasing the rate of 3-dose HPV immunization among individuals with HIV.
- Reduce the morbidity and mortality associated with HPV in people with HIV through early identification and treatment of potentially precancerous and cancerous lesions, when treatment is most likely to be effective.

Note on "experienced" and "expert" HIV care providers: Throughout this guideline, when reference is made to "experienced HIV care provider" or "expert HIV care provider," those terms are referring to the following 2017 NYSDOH AI definitions:

- Experienced HIV care provider: Practitioners who have been accorded HIV Experienced Provider status by the American Academy of HIV Medicine or have met the HIV Medicine Association's definition of an experienced provider are eligible for designation as an HIV Experienced Provider in New York State. Nurse practitioners and licensed midwives who provide clinical care to individuals with HIV in collaboration with a physician may be considered HIV Experienced

Providers as long as all other practice agreements are met (8 NYCRR 79-5:1; 10 NYCRR 85.36; 8 NYCRR 139-6900). Physician assistants who provide clinical care to individuals with HIV under the supervision of an HIV Specialist physician may also be considered HIV Experienced Providers (10 NYCRR 94.2)

- Expert HIV care provider: A provider with extensive experience in the management of complex patients with HIV.

HPV-Associated Cancers

HPV-associated cancers: Cervical cancer rates have decreased because of a robust screening system in the United States that has been in place since the 1960s [NCI(a) 2022]. The incidence of anal cancer persists, particularly among men who have sex with men (MSM) with or without HIV and among women with HIV [Islami, et al. 2017; Palefsky 2017; Hessol, et al. 2013], and approximately 91% of anal cancers are thought to be caused by human papillomavirus (HPV) [CDC(a) 2022].

This committee has recommended anal screening for specific subpopulations of individuals with HIV since 2007 and recently expanded the recommendation to include anal cytology screening for MSM, cisgender women, transgender women, and transgender men who have HIV and are ≥35 years old. Anal Cancer HSIL Outcomes Research (ANCHOR) study investigators announced by press release in October 2021 that treatment of precancerous lesions reduced anal cancer risk among people with HIV [ANCHOR 2021]. Although screening tests are available for oropharyngeal cancers, the utility and benefits have not been established; therefore, screening other than visual inspection is not yet recommended (see American Dental Association: Evaluation of Potentially Malignant Disorders in the Oral Cavity Clinical Practice Guideline [2017] for more information). There are no routine screening tests or procedures for vulvar, vaginal, or penile cancers.

HPV types: There are many HPV types, some of which cause cancer (oncogenic) and others of which cause noncancerous disease (nononcogenic verruca vulgaris and condyloma acuminata). Approximately 30 different HPV types infect cells in the anus and genital tract, including the cervix, and may cause asymptomatic infection, condylomata acuminata (genital warts), squamous intraepithelial lesions (SILs), glandular cell abnormalities, and anal and cervical cancer or other genital carcinomas. HPV is also associated with oropharyngeal cancer [CDC(a) 2022; CDC(b) 2022]. HPV infection is often asymptomatic, and the time course from initial infection to the presence of lesions has not been determined, preventing a reliable method for determining the source and time of acquisition.

In the general U.S. population, HPV types 16 and 18 are responsible for approximately 70% of cases of cervical and anal SILs and cervical and anal cancers [Lowy and Schiller 2012; Steinbrook 2006] in addition to most oropharyngeal, vaginal, vulvar, and penile cancers [Saraiya, et al. 2015; Forman, et al. 2012; Grulich, et al. 2010; Bouvard, et al. 2009]. Nononcogenic HPV types 6 and 11 cause >90% of genital warts [CDC(a) 2021; Workowski, et al. 2021]. A wider range and higher prevalence of HPV types responsible for oncogenic and nononcogenic disease have been documented in people with HIV [Massad, et al. 2016; Kojic, et al. 2011; Clifford, et al. 2006]. HPV-associated cancers occur more often among people with HIV than in the general population [Liu, et al. 2018; Jemal, et al. 2013], and the distribution of HPV types responsible for SILs and warts also differs between these populations [Clifford, et al. 2006].

High-risk HPV types that are related to anogenital cancers include types 16, 18, 26, 31, 33, 35, 39, 45, 51, 52, 53, 56, 58, 59, 66, 67, 68, 69, 70, 73, and 82 [Guan, et al. 2012; Hariri, et al. 2012]. Although high-risk HPV types are detected in 99% of cervical cancers, types 16 and 18 are the most oncogenic [Clifford, et al. 2017; Keller, et al. 2015] and account for nearly 70% of all cervical cancers in the general population [CDC(a) 2021]. HPV type 16 is the most common high-risk type among individuals with or without HIV [Lin, et al. 2018]. Among individuals with HIV, cervical cancer is associated with types 16 and 18 and high-risk types 51, 52, 53, 56, 58, and 59 [McKenzie, et al. 2010]. High-risk HPV types other than type 16 are more common and are more frequently associated with anal cancer among MSM with HIV than MSM without HIV [Poynten, et al. 2021]. Infection with more than one HPV type occurs more frequently among individuals with HIV, and these individuals can be at risk of cervical and anal SILs and nonmalignant disease simultaneously [Castilho, et al. 2015; Clifford, et al. 2006].

Tobacco use: Tobacco use is an established contributor to the oncogenic potential of HPV and is an independent risk factor for acquisition and progression of cervical SILs [Collins, et al. 2010], anal neoplasia [Daling, et al. 2004], oropharyngeal cancer [NCI(b) 2022], and vulvar cancer in individuals with HIV [ACS 2018; Kutlubay, et al. 2013]. Some data suggest that HIV-related immune suppression can contribute to relapse and progression of HPV disease, and antiretroviral therapy-mediated immune reconstitution can lead to regression of SILs associated with HPV infection [Blitz, et al. 2013]. Other studies do not support this finding [Piketty, et al. 2013; Adler 2010].

HPV Prevention

☑ RECOMMENDATION

HPV Prevention

- Given the increased lifetime risk of persistent human papillomavirus (HPV) infection and increased prevalence of HPV-related cancers, clinicians should recommend the 9-valent HPV vaccine 3-dose series at 0, 2, and 6 months to all individuals with HIV who are 9 to 45 years old regardless of CD4 cell count, prior cervical or anal screening results, HPV test results, HPV-related cytologic changes, or other history of HPV-related lesions. (A3)

HPV Vaccine

In 2006, the U.S. Food and Drug Administration (FDA) approved a 9-valent vaccine that protects against nononcogenic HPV types 16, 18, 31, 33, 45, 52, and 58 (Gardasil 9). Because it offers broader coverage of HPV types, the 9-valent vaccine is the only HPV vaccine available in the United States (see CDC supplemental information and guidance for vaccination providers regarding use of 9-valent HPV for more information). The HPV vaccine is approved by the FDA for preventive but not therapeutic use.

Extrapolating data from the demonstrated effectiveness of the quadrivalent HPV vaccine in older individuals [Wilkin, et al. 2018], the FDA expanded the age range for recommended HPV vaccination in the United States from ages 9 to 26 years to ages 27 to 45 years [FDA 2020]. There is no specific mention of HIV infection in the updated FDA recommendation. Although 1 study demonstrated lower efficacy of the quadrivalent vaccine in individuals with HIV [Wilkin, et al. 2018], other research linked HIV viral suppression to vaccine efficacy [Money, et al. 2016]. Given the increased lifetime burden of persistent HPV infection, disease, and morbidity, proactive vaccination among individuals with HIV is a strategic means of primary prevention and potential disease mitigation that should be strongly considered and encouraged [Di Donato, et al. 2021; Karimi-Zarchi, et al. 2020; Lichter, et al. 2020].

When to Vaccinate

HPV vaccination may be scheduled at the same time as standard adolescent vaccines offered at ages 9 to 12 years. If possible, the vaccine series should begin at age 9 years [Glidden, et al. 2016]. The 3-dose vaccine regimen is recommended for all patients with HIV who are 9 to 45 years old. The 9-valent HPV vaccine should be administered according to the CDC standard schedule for immunocompromised adults, children, and adolescents (a 3-dose regimen over a 6-month period at 0, 2, and 6 months) and should be offered regardless of CD4 cell count.

HPV vaccination provides high levels of neutralizing antibody for at least 5 years and is protective in individuals ≤26 years old who do not have HIV, regardless of history of sexual activity; however, the full length of its protection has not been established. In an observational study conducted in England that examined the effectiveness of a national HPV immunization program, the reduction in cervical cancer was greatest in individuals who received the vaccine at ages 12 to 13 years [Falcaro, et al. 2021]. Although data are limited, the immunogenicity of the quadrivalent HPV vaccine has been demonstrated in individuals with HIV [Wilkin, et al. 2018; Kojic, et al. 2014].

HPV testing and vaccination: HPV testing is not recommended before vaccine administration. It is unlikely that an individual will have been infected with all the HPV types covered by the 9-valent vaccine; therefore, it is expected that the 9-valent HPV vaccine will be effective against any of the 9 HPV types or any HPV types to which the individual has not been exposed. There also may be beneficial prevention due to cross-reactivity with other HPV types not included in the 9-valent vaccine [Wheeler, et al. 2012].

Revaccination with the 9-valent HPV vaccine is not currently recommended for individuals previously immunized with the bivalent or quadrivalent HPV vaccine [ACOG 2020; Petrosky, et al. 2015]. Vaccination with the quadrivalent HPV vaccine has demonstrated cross-protection against other oncogenic HPV types [Kemp, et al. 2011]. There is no maximum interval between vaccine doses; as long as all 3 doses are given, there is no need to repeat doses if a scheduled vaccination is not given on schedule [CDC(b) 2021].

→ KEY POINT

- HPV testing is not recommended before administration of the HPV vaccine.

Other Forms of HPV Prevention

HPV infection is the most common sexually transmitted infection (STI) in the United States, and many individuals become infected with multiple types of HPV during their lives [CDC(c) 2021]. Most HPV infections resolve, become latent, or are not detectable on clinical assays within a few years of exposure and infection [Ho, et al. 1998; Moscicki, et al. 1998; Evander, et al. 1995]. HPV is transmitted via skin-to-skin contact, so barrier methods such as condoms offer some but not full protection. Because prior identification of HPV infection in a sexual partner is unlikely, limiting the number of sexual partners may reduce but not eliminate an individual's exposure to HPV [Workowski, et al. 2021].

→ KEY POINTS

- Inform patients with HIV about the risk of acquiring HPV and other STIs from close physical contact with the external genitalia, anus, cervix, vagina, urethra, mouth and oral cavity, or any other location where HPV lesions are present.
- Consistent and correct condom use remains an effective way to prevent the transmission of most STIs, including HPV. However, inform patients that barrier protection such as condoms and dental dams may not fully protect against HPV.

Cervical and Anal Cancer Screening

☑ RECOMMENDATIONS

Cervical and Anal Cancer Screening

- Clinicians should perform cervical and anal cytologic screening for individuals with HIV, regardless of their human papillomavirus (HPV) vaccination status. (A3)
- Clinicians should examine the neovagina in transgender women who have undergone vaginoplasty to assess for visible HPV lesions at baseline and during the annual comprehensive physical examination; examination can be done using an anoscope, a small vaginal speculum, or a nasal speculum. (A3)
- At each routine monitoring visit, clinicians should ask all patients about sexual behaviors and new sex partners to assess for risk behaviors that require repeat or ongoing screening. (A3)

Cervical cancer screening: Clinicians should perform cervical and anal cytologic screening for people with HIV according to the recommendations in the NYSDOH AI guidelines Screening for Cervical Dysplasia and Cancer in Adults With HIV and Screening for Anal Dysplasia and Cancer in Adults With HIV. HPV testing with cytologic screening enhances the identification of HPV-related cervical disease in individuals with HIV. Examination of the anogenital area of patients with HIV to assess for visible HPV lesions is necessary because HPV can also infect the urethra and the external genitalia [Ehrenpreis and Smith 2018; Leeds and Fang 2016; Tyerman and Aboulafia 2012; Weyers, et al. 2010]. Speculum examination of the vagina, neovagina, and cervix and anoscopic examination of the anus and lower rectum may also reveal lesions. There are currently no data on urethral screening and treatment, but referral to a urologist will facilitate appropriate assessment and management when this is a concern.

Anal cancer screening: Anal squamous intraepithelial lesions (SILs) have been associated with concurrent cervical SILs; however, they also occur independently. Anal cytology should be performed for all cisgender women with HIV [Gaisa, et al. 2017; Stier, et al. 2015; Hessol, et al. 2013; Kojic, et al. 2011], with or without cervical abnormalities, according to guidelines for adults with HIV. Although there are no specific data on transgender men or transgender women, anal screening is also recommended for these populations.

Transgender individuals: It is important that care providers and facilities establish a safe and welcoming environment for transgender patients [UCSF 2016]. Approximately one-third of transgender or gender-diverse individuals assigned female sex at birth identify as nonbinary [National Center for Transgender Equality 2016]. Asking patients to provide details about all gender-affirming and gynecologic surgical procedures will help establish the need for screening for HPV-related cancers. For terminology and definitions related to transgender care, see University of California San Francisco Gender-Affirming Health Program.

Sexual history: Discussion of sexual health, including a patient's history of sexually transmitted infections (STIs), is an important component of the baseline and annual assessments and is an opportunity to discuss a patient's concerns and questions. The frequency of the sexual health assessment is based on risk factors. It is particularly important to use nonjudgmental, sex-positive language in this discussion to establish a strong connection and facilitate open discussion.

→ KEY POINTS

- Regardless of cytology results, it is important that screening for STIs is performed routinely in patients who engage in risk behaviors. For more information, see CDC: 2021 STI Treatment Guidelines.
- Assessment for visible HPV lesions in individuals with HIV can be accomplished through baseline and then annual examination of the periurethral and anogenital areas and the vagina and cervix.

Presentation and Diagnosis of HPV Infection

☑ RECOMMENDATIONS

Presentation and Diagnosis of HPV Infection

- Clinicians with limited expertise should refer patients with abnormal anogenital physical findings, such as warts, hypopigmented or hyperpigmented plaques/lesions, lesions that bleed, or any other lesions of uncertain etiology, for expert evaluation, which may include colposcopy, HRA, or biopsy. (A3)
- Clinicians should maintain a low threshold for obtaining biopsies of lesions that are atypical in appearance; condylomatous; hypopigmented, hyperpigmented, or variegated; or that fail to respond to standard treatment. (A3)
- Clinicians should conduct or refer patients with abnormal cervical or anal cytology results for colposcopy, HRA, or biopsy. (A3)
- Clinicians should refer individuals with visible urethral lesions to a urologist experienced in HPV biopsy and diagnosis. (A3)
- Clinicians should diagnose, treat, and follow up on HPV-related lesions in patients with HIV in consultation with a clinician experienced in the management of HPV and HIV. (A3)

Abbreviations: HPV, human papillomavirus; HRA, high-resolution anoscopy.

Diagnosis of external condylomata acuminata is often made based on clinical appearance. The appearance of warts varies. Condylomata acuminata (genital warts) can be smooth and skin-colored or hyperpigmented papules or plaques that may be flat, hyperkeratotic, nodular, or exophytic. Symptoms may be absent or may include itching, bleeding, burning, and discomfort. Warts on the external genitalia and the cervix are commonly flat, plaque-like lesions but may also be exophytic and visible to the naked eye. Cervical lesions are best visualized by colposcopy. Penile lesions can occur along the shaft but may also occur along the penile urethra and be hidden from view.

Small external lesions are often treated without biopsy. Lesions that are atypical or variegated in color or shape require biopsy to exclude squamous intraepithelial lesions (SILs) or cancer. Clinicians should maintain a low threshold for obtaining biopsies of the following, which may indicate precancerous or cancerous lesions: atypical-appearing lesions; pigmented, internal, or condylomatous lesions; rapidly growing lesions; or lesions that fail to respond to standard treatment.

Manifestations of HPV infection in individuals with HIV infection may include the following [Wang and Palefsky 2019; Liu, et al. 2018; Clifford, et al. 2017; Palefsky 2017; Lillo, et al. 2001; Minkoff, et al. 2001; Palefsky(a), et al. 2001; Palefsky(b), et al. 2001; Frisch, et al. 2000; Palefsky, et al. 1998]:

- Condylomata acuminata, anal SILs, anal intraepithelial neoplasia, cervical SILs, and cervical intraepithelial neoplasia have all been reported to occur more frequently in people with HIV.
- With increased immunosuppression, there is evidence for increased risk of persistent and recurrent HPV infection and disease of the anal and genital tracts; decreased rates of spontaneous disease regression; increased severity of HPV disease; anal SILs and cervical SILs; and development of condylomata acuminata.
- HPV infection may be more difficult to treat and more likely to recur with advanced immunosuppression.
- Patients with more advanced immunosuppression have an increased relative risk of developing HPV-related invasive anogenital cancers.

◊ RESOURCES

For images of the clinical manifestations of HPV, see the following:

- U.S. Department of Veterans Affairs > Human Papillomavirus
- CDC Public Health Image Library > Quick Search > HPV
- MedicineNet.com > Sexually Transmitted Diseases > Picture of Genital Warts (HPV)

Data are mixed regarding the contribution of HIV-related immune suppression to the relapse and progression of HPV disease and whether antiretroviral therapy (ART)-mediated immune reconstitution can lead to regression of SIL associated with HPV infection [Blitz, et al. 2013; Piketty, et al. 2013; Adler 2010]. Although there are cases of involution of mucocutaneous warts after initiation of ART, the prevalence or course of anogenital HPV disease is not altered significantly by ART [Lofgren, et al. 2015; Adler 2010].

→ KEY POINTS

- Cervical and anogenital symptoms of HPV-associated disease include itching, bleeding, pain, or spotting after sexual intercourse. Consider HPV-associated disease in the differential diagnosis when symptoms are present.
- Failure to correctly diagnose precancerous or cancerous HPV-related disease in a timely manner can delay therapy and possibly lead to mortality. Therefore, maintain a low threshold for obtaining biopsies of lesions that are atypical in appearance, are condylomatous, have variegated pigmentation, or that fail to respond to standard treatment.

HPV Treatment

☑ RECOMMENDATIONS

HPV Treatment

- Clinicians should not use sinecatechins in patients with HIV. (A3)
- Clinicians should obtain a biopsy to exclude dysplasia or cancer for condyloma that have not responded to treatment. (A3)
- Clinicians should switch treatment modalities if biopsy-confirmed warts or condyloma have not improved substantially within 4 months of therapy. (A3)
- Clinicians should refer patients with lesions that are resistant to topical therapies; that change in appearance; that have ulceration, irregular shape, or variegated pigmentation; or with biopsy-proven dysplasia to clinicians experienced in the management of human papillomavirus (HPV) and HIV. (A3)
- Clinicians should refer patients with visible urethral lesions to a urologist for treatment. (A3)
- Clinicians should refer patients with HIV who have anogenital cancer to an oncologist for treatment. (A3)
- Clinicians should avoid the use of imiquimod in pregnant individuals unless the benefits outweigh the risk. (A3)
- Clinicians should not use sinecatechins, podophyllin, or podofilox (podophyllotoxin) in pregnant individuals. (A3)
  - See CDC: 2021 STI Treatment Guidelines > Anogenital Warts.

The standard therapeutic approach to treating HPV-related nonmalignant lesions (condyloma/warts) and dysplasia (squamous intraepithelial lesions or above) in individuals with HIV is the same as that for individuals without HIV. Treatment of condyloma is aimed at removing symptomatic visible warts. However, some untreated warts may resolve spontaneously. There has been no evidence that any available treatment regimen eradicates HPV infection. Comparative efficacy trials of the different treatment options for patients with HIV have not been conducted. Treatment of precancerous lesions includes ablation, using cryotherapy or laser, and surgical or laser excision. These procedures should be performed only by experienced clinicians (for more information, see NYSDOH AI guideline Screening for Cervical Dysplasia and Cancer in Adults With HIV).

Cryotherapy, electrocautery, podophyllotoxin, interferon, imiquimod, cidofovir gel, trichloroacetic acid, and bichloroacetic acid have all demonstrated efficacy treating anogenital warts in patients without HIV. In a systematic

review and meta-analysis, electrocautery and imiquimod were shown to be efficacious in treating anogenital warts in people with HIV [Werner, et al. 2017]. Controlled studies of other HPV interventions in people with HIV have not been done. Interferon, 5-fluorouracil, and podophyllotoxin are no longer preferred HPV treatments in the primary care setting because of low efficacy and toxicity that may limit their routine use [Lacey, et al. 2013]. The safety and efficacy of sinecatechins have not been evaluated in individuals with HIV and therefore should not be used [FDA 2007].

There are limited data on imiquimod use in pregnancy, but animal data suggest low risk of harm [Workowski, et al. 2021]. This drug can be used during pregnancy if no other options, including waiting until after delivery, are available. Because of a lack of safety data, podophyllin should not be used during pregnancy. Podofilox (podophyllotoxin) is contraindicated in pregnancy [Briggs, et al. 2017].

Data on treating HPV lesions of the neovagina, whether penile or colonic in origin, are limited to case reports and small case series. Standard, care provider-applied approaches to treatment should be used [Labanca and Mañero 2017; van der Sluis, et al. 2016; Matsuki, et al. 2015; Wasef, et al. 2005; Liguori, et al. 2004; Fiumara and Di Mattia 1973].

Clinicians often report poor clearance rates after therapy in patients with HIV [Richel, et al. 2013]. More than one application of therapy, more than one method of treatment (e.g., topical imiquimod followed by cryotherapy), or longer duration of treatment is often needed. Treatment length may vary, and frequent visits (as often as biweekly) are necessary to assess lesion regression and adverse effects. Topical treatments may cause adverse effects such as irritation and a burning sensation, which may affect treatment adherence. The response to treatment and its adverse effects should be evaluated throughout the course of therapy. The treatment approach may need to be changed if a patient has not improved substantially after standard therapy. There are no data available regarding effects of HPV treatment on HPV transmissibility.

When deciding whether to treat a patient with HIV for anogenital warts or refer the patient to a specialist, clinicians should consider their own experience and available resources, diagnostic certainty, anatomic site of lesions, potential adverse effects of treatment, and the patient's ability to adhere to treatment.

Table 1, below, lists available treatment options for condyloma for patients with HIV.

Table 1: Available Treatment Options for Anogenital Condyloma for Patients With HIV [a]

Condyloma Type	**Treatment** [b,c]	**Comments**
Anogenital condyloma	• Cryotherapy with liquid nitrogen or cryoprobe • Surgical excision • TCA or BCA 80%–90% solution [d] **Patient self-administered treatments:** • Imiquimod 3.75% or 5% cream [e] • Podofilox 0.5% solution or gel [e]	• Use for external anogenital warts, including warts on penis, groin, scrotum, vulva, perineum, external anus, and perianus. • Patients with external anal or perianal warts may also have intra-anal warts and therefore might benefit from inspection of the anal canal by digital examination or anoscopy (standard or high resolution). • Imiquimod may weaken condoms and vaginal diaphragms.
Urethral meatus condyloma	• Cryotherapy with liquid nitrogen • Surgical excision	—
Vaginal condyloma	• Cryotherapy with liquid nitrogen • Surgical excision • TCA or BCA 80%–90% solution [d]	Cryoprobe use in the vagina is not recommended because of the risk of vaginal perforation and fistula formation.
Cervical condyloma	• Cryotherapy with liquid nitrogen • Surgical excision • TCA or BCA 80%–90% solution [d]	• Management of cervical warts should include consultation with a specialist. • For patients who have exophytic cervical warts, a biopsy evaluation to exclude high-grade squamous intraepithelial lesions must be performed before treatment is initiated.

Table 1: Available Treatment Options for Anogenital Condyloma for Patients With HIV [a]		
Condyloma Type	**Treatment** [b,c]	**Comments**
Intra-anal condyloma	• Cryotherapy with liquid nitrogen • Surgical excision • TCA or BCA 80%–90% solution [d]	Management of intra-anal warts should include consultation with a colorectal specialist.
Neovaginal condyloma [f,g]	• Cryotherapy with liquid nitrogen or cryoprobe • Surgical excision • TCA or BCA 80%–90% [d] **Patient self-administered treatments:** • Imiquimod 3.75% or 5% cream [e] • Podofilox 0.5% solution or gel [e]	Imiquimod may weaken condoms and vaginal diaphragms.

Abbreviations: BCA, bichloroacetic acid; TCA, trichloroacetic acid.

Notes:

a. Adapted from [Workowski, et al. 2021] unless otherwise noted.
b. Sinecatechins should not be used in any individual with HIV because safety and efficacy data do not exist [FDA 2007].
c. Podophyllin resin is no longer recommended because of the number of safer options available.
d. TCA or BCA can be used to treat small external warts during pregnancy but may not be as effective.
e. Imiquimod, podophyllin, podofilox (podophyllotoxin), and sinecatechins should not be used in pregnant individuals [Briggs, et al. 2017].
f. If the neovagina was made using sigmoid colon tissue, treatments for intra-anal condyloma should be used.
g. [Labanca and Mañero 2017; van der Sluis, et al. 2016; Matsuki, et al. 2015; Wasef, et al. 2005; Liguori, et al. 2004; Fiumara and Di Mattia 1973]

Partner Exposure to HIV and HPV

☑ RECOMMENDATION

Partner Exposure to HIV and HPV

- When a patient with HIV is diagnosed with human papillomavirus (HPV), clinicians should advise the patient to encourage sex partners to seek evaluation for possible exposure to both HPV and HIV. (A3)

Treatment of lesions solely for the prevention of future transmission cannot be recommended because the value of treatment in reducing infectivity is not known. However, sex partners of patients who have genital lesions might benefit from counseling and examination to assess the presence of genital warts and HPV-related dysplasia. Sex partners should also be evaluated for other sexually transmitted infections (STIs), including HIV, because HPV disease is transmitted sexually [Workowski, et al. 2021].

Clinicians should inform patients that any sex partner who does not have confirmed HIV infection should have routine HIV testing for early identification of HIV acquisition. If a patient with an HIV exposure presents within 36 hours, evaluation for non-occupational post-exposure prophylaxis (PEP) should occur. When possible, onsite availability of HIV testing and STI treatment for partners is ideal because it may increase the likelihood that partners will receive timely access to HIV testing and appropriate treatment, including HIV PEP and treatment for the STI as needed. Such strategies may also increase identification of individuals who require ongoing medical care. Partner education about reducing high-risk sexual behaviors, including counseling about the use of male/insertive and female/receptive condoms and making condoms visibly available in the clinic, may help further decrease the risk of transmission of both HIV and other STIs. Patients who remain at high risk of exposure after completing a course of non-occupational PEP and who are negative for HIV at the time of the 4-week test should be offered pre-exposure prophylaxis (PrEP), to begin immediately after the last dose of non-occupational PEP. Patient education about undetectable=untransmittable (U=U) as an HIV prevention strategy should stress that an undetectable HIV viral load prevents only the sexual transmission of HIV.

☆ NEW YORK STATE LAW

- New York State Public Health Law requires that medical providers talk with individuals with HIV about their options for informing their sex partners that they may have been exposed to HIV, including the free, confidential partner notification assistance offered by the NYSDOH and New York City Department of Health and Mental Hygiene.

The NYSDOH Partner Services program provides assistance to individuals with HIV and care providers who would like help notifying a patient's sex partner(s) of possible exposure to HIV, chlamydia, gonorrhea, or syphilis. Available options for partner notification include anonymous notification from the local health department, dual disclosure (patient disclosure with the help of Partner Services staff), and self-disclosure. Partner Services staff within local health departments work with patients to develop a plan to notify their partners, whether that plan includes staff notifying potentially exposed partners anonymously or helping patients who choose to tell their partners on their own develop a notification plan and strategy.

→ KEY POINTS

- The local health department may contact a sex partner confidentially about a potential HIV exposure and treatment options.
- Counsel patients about partner notification, risk reduction, and safer sex practices (see NYSDOH Let's Talk About You).

All Recommendations

☑ ALL RECOMMENDATIONS: PREVENTION AND MANAGEMENT OF HPV INFECTION IN ADULTS WITH HIV

HPV Prevention

- Given the increased lifetime risk of persistent HPV infection and increased prevalence of HPV-related cancers, clinicians should recommend the 9-valent HPV vaccine 3-dose series at 0, 2, and 6 months to all individuals with HIV who are 9 to 45 years old regardless of CD4 cell count, prior cervical or anal screening results, HPV test results, HPV-related cytologic changes, or other history of HPV-related lesions. (A3)

Cervical and Anal Cancer Screening

- Clinicians should perform cervical and anal cytologic screening for individuals with HIV, regardless of their HPV vaccination status. (A3)
- Clinicians should examine the neovagina in transgender women who have undergone vaginoplasty to assess for visible HPV lesions at baseline and during the annual comprehensive physical examination; examination can be done using an anoscope, a small vaginal speculum, or a nasal speculum. (A3)
- At each routine monitoring visit, clinicians should ask all patients about sexual behaviors and new sex partners to assess for risk behaviors that require repeat or ongoing screening. (A3)

Presentation and Diagnosis of HPV Infection

- Clinicians with limited expertise should refer patients with abnormal anogenital physical findings, such as warts, hypopigmented or hyperpigmented plaques/lesions, lesions that bleed, or any other lesions of uncertain etiology, for expert evaluation, which may include colposcopy, HRA, or biopsy. (A3)
- Clinicians should maintain a low threshold for obtaining biopsies of lesions that are atypical in appearance; condylomatous; hypopigmented, hyperpigmented, or variegated; or that fail to respond to standard treatment. (A3)
- Clinicians should conduct or refer patients with abnormal cervical or anal cytology results for colposcopy, HRA, or biopsy. (A3)
- Clinicians should refer individuals with visible urethral lesions to a urologist experienced in HPV biopsy and diagnosis. (A3)
- Clinicians should diagnose, treat, and follow up on HPV-related lesions in patients with HIV in consultation with a clinician experienced in the management of HPV and HIV. (A3)

HPV Treatment

- Clinicians should not use sinecatechins in patients with HIV. (A3)
- Clinicians should obtain a biopsy to exclude dysplasia or cancer for condyloma that have not responded to treatment. (A3)
- Clinicians should switch treatment modalities if biopsy-confirmed warts or condyloma have not improved substantially within 4 months of therapy. (A3)
- Clinicians should refer patients with lesions that are resistant to topical therapies; that change in appearance; that have ulceration, irregular shape, or variegated pigmentation; or with biopsy-proven dysplasia to clinicians experienced in the management of HPV and HIV. (A3)
- Clinicians should refer patients with visible urethral lesions to a urologist for treatment. (A3)
- Clinicians should refer patients with HIV who have anogenital cancer to an oncologist for treatment. (A3)
- Clinicians should avoid the use of imiquimod in pregnant individuals unless the benefits outweigh the risk. (A3)
- Clinicians should not use sinecatechins, podophyllin, or podofilox (podophyllotoxin) in pregnant individuals. (A3)
  - See CDC: 2021 STI Treatment Guidelines > Anogenital Warts.

Partner Exposure to HIV and HPV

- When a patient with HIV is diagnosed with HPV, clinicians should advise the patient to encourage sex partners to seek evaluation for possible exposure to both HPV and HIV. (A3)

Abbreviations: HPV, human papillomavirus; HRA, high-resolution anoscopy.

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Supplement: Guideline Development and Recommendation Ratings

Table S1: Guideline Development: New York State Department of Health AIDS Institute Clinical Guidelines Program	
Developer	New York State Department of Health AIDS Institute (NYSDOH AI) Clinical Guidelines Program
Funding source	NYSDOH AI
Program manager	Clinical Guidelines Program, Johns Hopkins University School of Medicine, Division of Infectious Diseases. See Program Leadership and Staff.
Mission	To produce and disseminate evidence-based, state-of-the-art clinical practice guidelines that establish uniform standards of care for practitioners who provide prevention or treatment of HIV, viral hepatitis, other sexually transmitted infections, and substance use disorders for adults throughout New York State in the wide array of settings in which those services are delivered.
Expert committees	The NYSDOH AI Medical Director invites and appoints committees of clinical and public health experts from throughout New York State to ensure that the guidelines are practical, immediately applicable, and meet the needs of care providers and stakeholders in all major regions of New York State, all relevant clinical practice settings, key New York State agencies, and community service organizations.
Committee structure	• Leadership: AI-appointed chair, vice chair(s), chair emeritus, clinical specialist(s), JHU Guidelines Program Director, AI Medical Director, AI Clinical Consultant, AVAC community advisor • Contributing members • Guideline writing groups: Lead author, coauthors if applicable, and all committee leaders
Disclosure and management of conflicts of interest	• Annual disclosure of financial relationships with commercial entities for the 12 months prior and upcoming is required of all individuals who work with the guidelines program, and includes disclosure for partners or spouses and primary professional affiliation. • The NYSDOH AI assesses all reported financial relationships to determine the potential for undue influence on guideline recommendations and, when indicated, denies participation in the program or formulates a plan to manage potential conflicts. Disclosures are listed for each committee member.
Evidence collection and review	• Literature search and review strategy is defined by the guideline lead author based on the defined scope of a new guideline or update. • A comprehensive literature search and review is conducted for a new guideline or an extensive update using PubMed, other pertinent databases of peer-reviewed literature, and relevant conference abstracts to establish the evidence base for guideline recommendations. • A targeted search and review to identify recently published evidence is conducted for guidelines published within the previous 3 years. • Title, abstract, and article reviews are performed by the lead author. The JHU editorial team collates evidence and creates and maintains an evidence table for each guideline.

Table S1: Guideline Development: New York State Department of Health AIDS Institute Clinical Guidelines Program	
Recommendation development	• The lead author drafts recommendations to address the defined scope of the guideline based on available published data. • Writing group members review the draft recommendations and evidence and deliberate to revise, refine, and reach consensus on all recommendations. • When published data are not available, support for a recommendation may be based on the committee's expert opinion. • The writing group assigns a 2-part rating to each recommendation to indicate the strength of the recommendation and quality of the supporting evidence. The group reviews the evidence, deliberates, and may revise recommendations when required to reach consensus.
Review and approval process	• Following writing group approval, draft guidelines are reviewed by all contributors, program liaisons, and a volunteer reviewer from the AI Community Advisory Committee. • Recommendations must be approved by two-thirds of the full committee. If necessary to achieve consensus, the full committee is invited to deliberate, review the evidence, and revise recommendations. • Final approval by the committee chair and the NYSDOH AI Medical Director is required for publication.
External reviews	• External review of each guideline is invited at the developer's discretion. • External reviewers recognized for their experience and expertise review guidelines for accuracy, balance, clarity, and practicality and provide feedback.
Update process	• JHU editorial staff ensure that each guideline is reviewed and determined to be current upon the 3-year anniversary of publication; guidelines that provide clinical recommendations in rapidly changing areas of practice may be reviewed annually. Published literature is surveilled to identify new evidence that may prompt changes to existing recommendations or development of new recommendations. • If changes in the standard of care, newly published studies, new drug approval, new drug-related warning, or a public health emergency indicate the need for immediate change to published guidelines, committee leadership will make recommendations and immediate updates and will invite full committee review as indicated.

Table S2: Recommendation Ratings and Definitions		
Strength	**Quality of Evidence**	
A: Strong B. Moderate C: Optional	1	Based on published results of at least 1 randomized clinical trial with clinical outcomes or validated laboratory endpoints.
	*	Based on either a self-evident conclusion; conclusive, published, in vitro data; or well-established practice that cannot be tested because ethics would preclude a clinical trial.
	2	Based on published results of at least 1 well-designed, nonrandomized clinical trial or observational cohort study with long-term clinical outcomes.
	2†	Extrapolated from published results of well-designed studies (including nonrandomized clinical trials) conducted in populations other than those specifically addressed by a recommendation. The source(s) of the extrapolated evidence and the rationale for the extrapolation are provided in the guideline text. One example would be results of studies conducted predominantly in a subpopulation (e.g., one gender) that the committee determines to be generalizable to the population under consideration in the guideline.
	3	Based on committee expert opinion, with rationale provided in the guideline text.