

HIV management in pregnancy

From preconception gyn care to postpartum follow-up, ObGyns can successfully manage the pregnant patient with HIV using a team-based care model

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Human immunodeficiency virus (HIV) is a single-stranded enveloped RNA retrovirus that was first described in the 1980s and is known for its severity of systemic immune dysregulation and associated opportunistic infections. It is transmitted through contact with blood or bodily fluids, and it can be transmitted vertically, most often at the time of delivery. Since the advent of antiretroviral therapy, the average life expectancy and natural course of HIV infection has improved notably.¹

In 2019, just over 1 million adults and adolescents in the United States were living with the diagnosis of HIV.² In the same year, the rate of new HIV diagnoses in the United States had stabilized at a rate of 13.2 new cases per 100,000 individuals.² Among this cohort, individuals identifying as females at birth accounted for 19% of the total

population living with HIV.² Sexual contact was the most common route of transmission, followed by injection drug use—77% and 20%, respectively.²

It is important to note that the incidence and prevalence of HIV does not reflect the individuals who unknowingly are living with the disease. The disease burden associated with HIV infection and the availability of effective treatment modalities has led to the recommendation that all individuals undergo HIV screening at least once in their lifetime.³ Early identification of HIV infection is important to optimize the health of all individuals and future generations.

The interplay between high-risk sexual practices and the risk for HIV exposure and unintended pregnancy places the ObGyn at the forefront of HIV prevention and identification. Early diagnosis and standardized treatment with antiretroviral therapies have led to both a dramatic improvement in adult disease burden and a dramatic decrease in perinatal transmission.^{4,5} In 2019, perinatal transmission accounted for less than 1% of HIV transmission in the United States.² This is a decrease of greater than 54% from 2014, which, again, emphasizes the role of the ObGyn in HIV management.⁶

Preconception care: Gynecologic screening, diagnosis, and management

The Centers for Disease Control and Prevention (CDC) recommends that an individual undergo HIV screening at least once in their



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TABLE 1 Initial laboratory assessments recommended upon a new diagnosis of HIV infection

CD4 T-lymphocyte cell counts
HIV genotyping panel
Glucose-6-phosphate dehydrogenase (G6PD) assay
Human lymphocyte antigen (HLA)-B 5701 testing
Complete blood count (CBC)
Comprehensive metabolic panel (CMP)
Toxoplasmosis immunity
Hepatitis B immunity panel
Hepatitis A total antibody testing
Hepatitis C antibody testing
Tuberculosis screening with purified protein derivative (PPD)
Rubella antibody titers
Tetanus antibody titers
Varicella antibody titers
Cytomegalovirus immunity

lifetime.³ HIV screening algorithms have changed over the last 20 years to reduce the number of false-positive and/or false-negative results obtained through HIV antibody testing alone.⁷ HIV-1/2 antibody/antigen immunoassay is recommended as the initial screening test. If reactive, this should be followed by an HIV p24-specific antigen test. Reactivity for both the HIV-1/2 immunoassay and the HIV p24-specific antigen test confirms the diagnosis of HIV infection. However, if HIV p24-specific antigen testing is indeterminate or an acute HIV infection is suspected, an HIV nucleic acid test (NAT) should be performed.^{7,8}

Upon a positive diagnosis, a multidisciplinary team approach is recommended to address the mental, social, and physical care of the patient. Team members should include an adult medicine clinician, an infectious disease clinician, an ObGyn, social services staff, and behavioral health support to achieve the goal of obtaining and maintaining the patient's optimal health status.

TABLE 1 lists the recommended initial laboratory assessments that should follow

TABLE 2 Recommended vaccinations for patients with HIV infection^{10,11}

Pneumococcal
Hepatitis B
Hepatitis A
Influenza
Measles-mumps-rubella (MMR)
Varicella
Human papillomavirus (HPV)
Tetanus-diphtheria-acellular pertussis (Tdap)
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)
Meningococcal

a new diagnosis of HIV infection. Based on the laboratory results, the indicated vaccinations, antibiotic prophylaxis for opportunistic infections, and optimal combined antiretroviral therapy (cART) can be determined.⁹ The vaccinations listed in **TABLE 2** should be up to date.^{10,11} Additionally, cervical cancer screening with cytology and human papillomavirus (HPV) testing and treatment should be performed in accordance with the 2019 American Society for Cervical Cancer Prevention (ASCCP) guidelines.¹²

Promptly initiating cART is of utmost importance; this decreases the rate of HIV transmission via sexual contact and decreases the rate of perinatal transmission.^{5,13} Results of the initial laboratory assessment, hepatitis B status, and desire for pregnancy/contraception should be considered when initiating cART.^{3,14,15}

It is imperative to discuss sharing the positive diagnostic results with the patient's partner. The CDC provides guidance for these discussions,¹⁶ which should address the use of preexposure prophylaxis (PrEP) if

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HIV-1/2 antibody/antigen immunoassay is recommended as the initial screening test. If reactive, this should be followed by an HIV p24-specific antigen test.

TABLE 3 Required prenatal testing in pregnant patients diagnosed with HIV²²

Syphilis
Gonorrhea
Chlamydia
Hepatitis C
HIV viral load
T-cell lymphocyte count
Hepatitis B surface antigen testing (HBsAg)

partner screening establishes partner serodiscordance (that is, HIV positivity in one partner and HIV negativity in the other partner). PrEP is a single pill approved by the US Food and Drug Administration (FDA) that combines tenofovir 300 mg and emtricitabine 200 mg daily¹⁷ and has been recommended since 2012.¹⁸⁻²⁰ PrEP also should be considered in sexually active individuals who have higher-risk behaviors within an area with high HIV prevalence.¹⁸⁻²¹ Despite the CDC’s strong recommendations for PrEP use, lack of insurance coverage and high cost are barriers to universal use. The National Alliance of State and Territorial AIDS Directors (NASTAD) provides a list of patient and copayment assistance programs that can be found at the NASTAD website: <https://nastad.org/prepcost-resources/prep-assistance-programs>.

Preconception considerations

In individuals with known HIV infection, preconception consultation with an ObGyn or maternal-fetal medicine (MFM) specialist should be recommended prior to conception.²² Preconception recommendations include addressing optimization of maternal medical comorbidities, addressing routine health screening and vaccinations, performing sexually transmitted infection screening, and optimizing HIV disease status.^{3,22,23}

With the assistance of adult medicine and infectious disease clinicians, a cART regimen that is sufficient to reliably maintain viral

suppression (that is, viral load < 50 copies/mL on 2 separate occasions at least 3 months apart) and is safe for use in pregnancy should be established.³ In serodiscordant couples, recommended mechanisms to prevent HIV transmission during conception include sustained viral suppression in the HIV-positive partner, PrEP use in the HIV-negative partner, and timing of unprotected intercourse during peak fertility only.³

Antepartum care

The initial prenatal visit

Women who have no prior screening for HIV or prior negative HIV results should undergo HIV screening at the first prenatal visit.³ Screening should be performed in accordance with the “opt out method.”⁶ Using this method, a woman without a known diagnosis of HIV infection is told that she will undergo HIV screening as a component of routine prenatal care *unless* she decides that she does not want this test performed.^{6,24,25} At the time of screening, all pregnant women should be provided with comprehensive information regarding HIV screening, HIV screening results, and the implications of HIV infection on pregnancy.²⁶

In the pregnant patient with confirmed HIV infection, all preconception considerations should be addressed. If not already in place, referrals to appropriate providers (infectious disease specialist, ObGyn, MFM specialist) and ancillary support staff (social services, behavioral health support) should be arranged. All efforts should be implemented to optimize additional medical comorbidities. **TABLE 3** lists additional prenatal testing requirements.²²

Antiretroviral therapy should be assessed for safety and efficacy in pregnancy and should comply with the CDC recommendations for cART in pregnancy.³ Patients with a T-lymphocyte cell count of less than 200 cells/mm³ and/or a viral load greater than 50 copies/mL despite adherent cART use should be referred to an infectious disease specialist to determine the need for alternative cART and/or the need for chemoprophylaxis against opportunistic infections.²³

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Preconception recommendations include addressing optimization of maternal medical comorbidities, addressing routine health screening and vaccinations, performing sexually transmitted infection screening, and optimizing HIV disease status

TABLE 4 Factors associated with a high risk of HIV exposure²⁷

Receive care in an area with an HIV incidence of ≥ 1 new case per 1,000 women per year
Incarcerated
Display clinical signs or symptoms of acute HIV infection (fever, lymphadenopathy, rash, myalgias, arthralgias, headache, oral ulcers, leukopenia, thrombocytopenia, or transaminase elevations) ²⁷
Diagnosed with another sexually transmitted infection in the past year
Report injection drug use themselves or injection drug use in their sex partner(s)
Exchange sex for alternative commodities
Report a new sex partner or more than 1 sex partner during the index pregnancy
Report sex partner(s) known to be infected with HIV or at high risk for HIV infection

First and second trimester

Antiretroviral adherence and barriers to adherence should be addressed at every prenatal visit. If the patient is started on antiretroviral therapy in pregnancy *or* is switched to an alternative cART regimen, viral load assessment should be performed 2 to 4 weeks after the start or change in cART and then repeated monthly until undetectable levels are achieved.^{3,26} If an undetectable viral load cannot be obtained, cART adherence should be thoroughly evaluated, and the patient should be referred to an infectious disease or HIV treatment specialist.²⁶

If the initial prenatal testing indicates an undetectable viral load, repeat viral load assessment can be performed every 3 months throughout the pregnancy.³ If initial prenatal testing indicates an undetectable HIV viral load and the T-lymphocyte count is greater than 200 cells/mm³, repeat viral load testing can be performed every 6 months to ensure stability.³

Early screening for gestational diabetes should be performed in patients receiving protease inhibitors because these agents may interfere with carbohydrate tolerance.^{22,26}

Third trimester

Women with negative HIV screening at the initial prenatal evaluation should undergo repeat HIV screening in the third trimester if they are at high risk for HIV exposure.²⁵ Factors that determine high-risk status are listed in **TABLE 4**.²⁷ Sexually transmitted

infection screening should be repeated in the third trimester.²⁶

Repeat assessment of the viral load should be completed between 34 and 36 weeks' gestation or sooner if additional indications for early term or late preterm delivery arise.³ Viral load assessments aid in determining delivery timing and route and the need for zidovudine (ZDV) treatment (**FIGURE**, page 21).

Studies that were performed prior to standardized cART use found higher rates of perinatal transmission associated with vaginal delivery when compared with cesarean delivery (CD).²⁸⁻³⁰ However, these studies did not account for measures of viral load within their study populations.²⁸⁻³⁰

In more recent studies performed in the era of standardized cART and viral load monitoring, CD does not provide protection from perinatal transmission when the maternal viral load is less than 1,000 copies/mL at the time of delivery.³¹ Similarly, delivery prior to 40 weeks' gestation does not confer protection from perinatal transmission.³²

Alternatively, if the maternal viral load is 1,000 copies/mL or greater, CD should be considered to reduce the risk of perinatal transmission. A scheduled, elective CD at 38 weeks' gestation is recommended in those with a maternal viral load of 1,000 copies/mL or greater and no medical indication for earlier delivery in order to decrease the likelihood of labor onset and/or rupture of membranes prior to delivery.^{3,33}

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Women with negative HIV screening at the initial prenatal evaluation should undergo repeat HIV screening in the third trimester if they are at high risk for HIV exposure

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TABLE 5 Intrapartum considerations in a pregnant patient with an HIV diagnosis^{3,26,49,50}

Zidovudine administration as determined by FIGURE ^{3,26}
Avoidance of invasive fetal monitoring (for example, fetal scalp electrodes) ²⁶
Epidural anesthesia can be used safely regardless of cART regimen ⁴⁹
Operative vaginal delivery should be avoided due to concerns for perinatal transmission, irrespective of maternal viral load, unless clear obstetric indications exist ³
Methergine and/or other ergot derivatives should be used only if all alternative uterotonic therapies have failed or are contraindicated in those with concurrent protease inhibitor or cobicistat use due to concerns for exaggerated vasoconstriction ^{3,50}
Personal protective equipment available and donned

Abbreviation: cART, combined antiretroviral therapy.

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A maternal viral load between 50 and 999 copies/mL has been associated with a perinatal transmission rate of 1% to 2% compared with less than 1% for a maternal viral load of less than 50 copies/mL or undetectable measures

Intrapartum care

Rapid antigen testing (with follow-up confirmatory testing as indicated) is recommended in patients presenting to labor and delivery with no prior documentation of HIV status.^{3,8,26}

Despite a significant decrease in perinatal transmission rates over the last 30 years, a large proportion of perinatal transmission cases are thought to result from intrapartum fetal exposure. While the mechanism of transmission is not known, a correlation between maternal viral load and risk for perinatal transmission has been shown. A maternal viral load of less than 1,000 copies/mL has been associated with a perinatal transmission risk of less than 2%.^{34,35} A maternal viral load between 50 and 999 copies/mL has been associated with a perinatal transmission rate of 1% to 2% compared with less than 1% for a maternal viral load of less than 50 copies/mL or undetectable measures.^{5,36,37}

These differences in perinatal transmission rates have prompted the recommendation for administration of ZDV for a minimum of 3 hours prior to delivery in mothers with a viral load of 1,000 copies/mL or greater.^{4,38} The recommended ZDV dosing is: a 1-hour intravenous loading dose of 2 mg/kg followed by continuous infusion of 1 mg/kg per hour until delivery.^{39,40} Patients who opt for vaginal delivery despite nonsuppressed viral loads

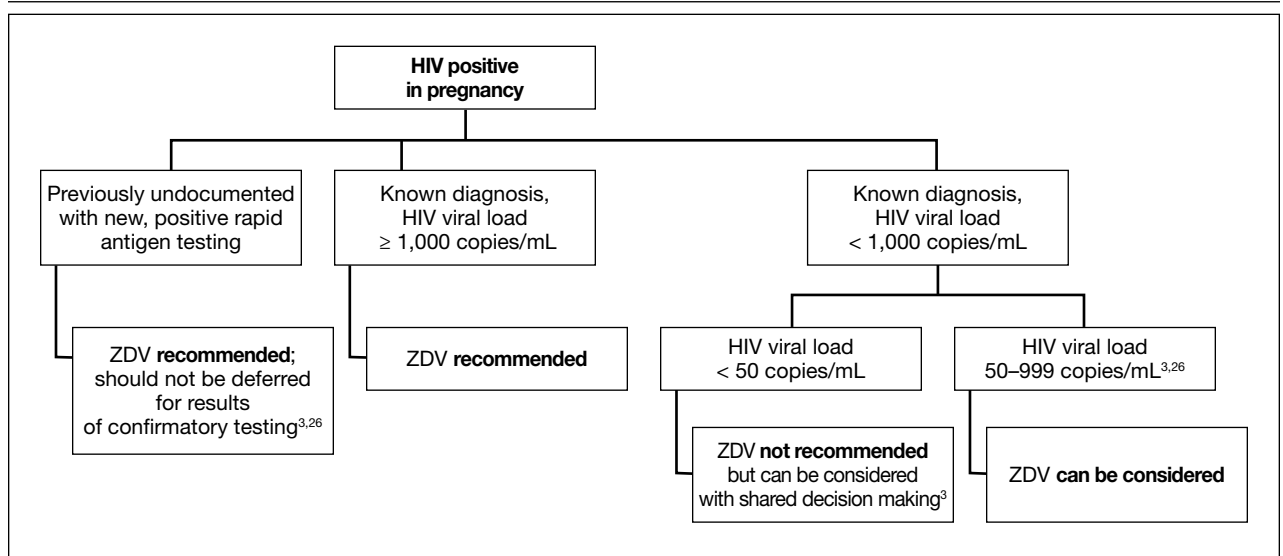
(≥1,000 copies/mL) after thorough perinatal counseling should receive ZDV at the start of labor through delivery.³ All patients should be continued on cART throughout their intrapartum and postpartum course.

The duration of membrane rupture and the use of invasive fetal monitoring (that is, fetal scalp electrodes) have been assessed as mechanisms of perinatal transmission. Although they were performed prior to the standardized use of cART, several studies demonstrated that increased perinatal transmission rates were associated with invasive fetal monitoring.^{34,41,42} While limited data have refuted this finding in women with suppressed viral loads (< 50 copies/mL), the American College of Obstetricians and Gynecologists recommends avoiding the use of invasive fetal monitoring in labor.²⁶

Pre-cART studies demonstrated increased rates of perinatal transmission with longer durations of membrane rupture prior to delivery.^{43,44} More recent studies have reevaluated this association and determined that the increased perinatal transmission rates are more likely associated with higher maternal viral loads at the time of delivery rather than duration of membrane rupture.⁴⁵⁻⁴⁷ No clear evidence describes when or if CD after the onset of labor or rupture of membranes provides protection from perinatal HIV transmission in pregnant women with HIV receiving no antiretroviral drugs or only ZDV during labor.^{43,48} CD can be considered for patients in whom scheduled, pre-labor CD was planned who present in labor or with rupture of membranes prior to scheduled CD.²⁶ These, and additional intrapartum considerations, are listed in **TABLE 5**.^{49,50}

Appropriate personal protective equipment should be available and donned for all providers present throughout intrapartum management and at delivery.^{23,26} Should any provider injury occur, immediate cleansing of the injury site should be performed, followed by referral to proper workplace supervisors for additional laboratory testing and antiretroviral prophylaxis.

FIGURE Intrapartum zidovudine (ZDV) administration recommendations based on HIV viral load assessment



Postpartum care

Postpartum contraception should be offered and provided in accordance with patient request. Regardless of other birth control methods, strict condom use should be advised. PrEP should be discussed and offered for all partners of serodiscordant couples.

Upon outpatient follow-up, assessment and provision of routine health maintenance should be performed. Any abnormal cervical pathology encountered during prenatal care should be managed in accordance with ASCCP guidelines.¹² Follow-up care should be established with adult medicine, infectious disease, and ObGyn clinicians.²⁶

Neonatal considerations

Neonates born to mothers with positive or unknown HIV status should undergo expedited HIV testing.^{51,52} Consultation should be conducted with pediatric or neonatology colleagues to determine the antiretroviral regimen and duration of therapy based on presumed HIV status of the neonate. Ideally, antiretroviral therapy should be initiated within 6 hours of delivery.^{3,53}

Formula feeding should be implemented as maternal HIV infection is one of the few

contraindications to breastfeeding.^{54,55} The risk of late breast milk transmission, defined as postnatal transmission that occurs after 1 month of age, may vary based on maternal viral load, but it has been reported as high as 8.9 transmissions per 100 person-years of breastfeeding.⁵⁶

Resources available

Care of the pregnant patient with HIV and the reduction of perinatal transmission both depend on early diagnosis of HIV and effective treatment with cART. Such patients benefit from a team-based care model that includes the ObGyn and/or MFM specialist, infectious disease clinician, pediatrician, and social worker. As guidelines evolve for care of these patients, a reference checklist, such as the examples provided at the Society for Maternal-Fetal Medicine website (smfm.org) or at HIV.gov, provide an outline for:

- management before, during, and after pregnancy
- suggestions for management teams of interest to successfully carry out the checklist requirements
- proposals for measurements of quality performance with the use of checklists

FAST TRACK

Formula feeding should be implemented as maternal HIV infection is one of the few contraindications to breastfeeding

in the management of HIV in pregnancy.

In addition, assistance with clinical decision making for patients with HIV in pregnancy can be obtained via telephone

consultation with the National Clinician Consultation Center–Perinatal HIV/AIDS (888-448-8765), which is available 24 hours a day, 7 days a week. ●

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