Pregnancy and Postpartum HIV Testing and Identification of Perinatal and Postnatal HIV Exposure

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Panel's Recommendations

- HIV testing is recommended for all sexually active people and should be a routine component of pre-pregnancy care (AII).
- All pregnant people should receive opt-out HIV testing as early as possible during each pregnancy (see Laboratory Testing for the Diagnosis of HIV Infection: Updated Recommendations and 2018 Quick Reference Guide: Recommended Laboratory HIV Testing Algorithm for Serum or Plasma Specimens from the Centers for Disease Control and Prevention [CDC]) (AII).
- Partners of all pregnant people should be referred for HIV testing when their status is unknown (AIII).
- Repeat HIV testing in the third trimester is recommended for pregnant people with negative initial HIV tests who are at increased risk of acquiring HIV, including those receiving care in facilities that have an HIV incidence of ≥1 case per 1,000 pregnant people per year, those who reside in jurisdictions (states or counties) with elevated HIV incidence among females aged 15 to 45 years (>17 per 100,000 females aged 15–45 years), or those who reside in states or territories that require third-trimester testing (AII). Annual state and county-level HIV diagnosis rates (as a proxy for incidence) are available at CDC's National Center for HIV, Viral Hepatitis, Sexually Transmitted Diseases, and Tuberculosis Prevention AtlasPlus webpage.
- Repeat HIV testing is recommended for pregnant people with a sexually transmitted infection, with signs and symptoms of acute HIV infection, or with ongoing exposure to HIV (AIII). Initiation of pre-exposure prophylaxis (PrEP) is recommended if HIV testing is negative (AIII). See Pre-Exposure Prophylaxis (PrEP) to Prevent HIV During Periconception, Antepartum, and Postpartum Periods for more information.
- Expedited[a] HIV testing should be performed during labor or after delivery for people with undocumented HIV status and for those who tested negative early in pregnancy but are at increased risk of HIV infection and were not retested in the third trimester (AII). HIV antigen/antibody testing should be available 24 hours a day, and results should be available within 1 hour. If results of expedited[a] HIV testing are positive, intrapartum intravenous zidovudine prophylaxis should be initiated immediately (AI); see Intrapartum Care for People with HIV.
- When acute HIV infection is suspected during pregnancy or the intrapartum period or while breastfeeding, a plasma HIV RNA assay should be performed in conjunction with an antigen/antibody immunoassay (AIII).
- When a person has a positive HIV test result during labor and delivery or postpartum, an HIV-1/HIV-2 antibody differentiation assay and an HIV RNA assay should be performed on the birthing parent (AI). In these situations, an HIV nucleic acid test (NAT) should be performed on the infant, with immediate initiation of presumptive HIV therapy appropriate for an infant at high risk of perinatal HIV transmission (AI); see Diagnosis of HIV Infection in Infants and Children for additional information.
- If HIV test results of the birthing parent are unavailable at birth, the newborn should be tested using an expedited[a] antibody test to identify perinatal HIV exposure (AI). If positive, an HIV NAT should be performed on the infant, and the birthing parent should be offered standard HIV diagnostic testing as soon as possible (AI).
    - In this situation, presumptive HIV therapy appropriate for infants who are at high risk of perinatal HIV transmission should be initiated immediately (AI). See Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection for guidance.
    - For people with an initial positive HIV test during labor or delivery or immediately postpartum who were planning to breastfeed, the Panel recommends against breastfeeding. Breast milk should be expressed and stored appropriately until all supplemental HIV tests are reviewed and are negative (AI).

- For postpartum people at increased risk of HIV acquisition, HIV testing and PrEP should be offered. If the parent is breastfeeding, consult an HIV specialist regarding frequency of HIV testing for the breastfeeding parent and/or infant (AIII).
- HIV test results of the birthing parent should be documented in the newborn's medical record and communicated to the newborn's primary care provider (AIII).
- To identify perinatal HIV exposure and possible HIV infection, HIV testing is recommended for infants and children in foster care and adoptees for whom the HIV status of the birthing parent is unknown (AIII) (see Diagnosis of HIV Infection in Infants and Children).

[a] The term "expedited" is used to designate HIV testing performed in situations when a very short turnaround time is optimal. Expedited testing is dependent on the available HIV tests in each facility and may include antigen/antibody immunoassays or antibody-only assays; see Approved HIV Tests in the text below.

Rating of Recommendations: A = Strong; B = Moderate; C = Optional

Rating of Evidence: I = One or more randomized trials in children[†] with clinical outcomes and/or validated endpoints; I = One or more randomized trials in adults with clinical outcomes and/or validated laboratory endpoints with accompanying data in children[†] from one or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; II = One or more well-designed, nonrandomized trials or observational cohort studies in children[†] with long-term outcomes; II* = One or more well-designed, nonrandomized trials or observational studies in adults with long-term clinical outcomes with accompanying data in children[†] from one or more similar nonrandomized trials or cohort studies with clinical outcome data; III = Expert opinion*

[†]Studies that include children or children and adolescents, but not studies limited to postpubertal adolescents

Overview

Incident HIV infection during pregnancy or postpartum among people who are breastfeeding represents a period of high viremia and significantly increased risk of infant HIV acquisition. Similarly, entering pregnancy without knowledge of HIV infection also presents a high risk of perinatal transmission. This section addresses HIV testing in pregnancy, during labor and delivery, and postpartum. The section also addresses HIV testing to identify HIV perinatal and postnatal exposure in infants. For guidance on diagnosis of HIV in infants and children, see Diagnosis of HIV in Infants and Children.

Approved HIV Tests and Recommended HIV Testing Algorithm

There are multiple U.S. Food and Drug Administration (FDA)–approved tests available for the diagnosis of HIV infection. Clinicians should familiarize themselves with the testing available at their facilities, including the turnaround time for receiving results and test performance characteristics (e.g. sensitivity, specificity). For the purposes of this section, three types of testing are discussed: antigen/antibody immunoassays; antibody-only immunoassays; and HIV nucleic acid tests (NATs).

- Antigen/antibody immunoassays: Most routine laboratory testing for HIV currently uses antigen/antibody tests. Because these tests also detect HIV p24 antigen, they can detect acute HIV infection as early as 1 to 2 weeks after appearance of HIV RNA and before appearance of HIV antibody. These tests also detect HIV-2 infection. Laboratory-based tests require trained laboratory staff, and results can be available within 1 hour, but in some hospitals the test may not be readily available 24 hours a day. One FDA-approved antigen/antibody test can be performed at the point of care (POC), provides results after 20 minutes, and must be read before 30 minutes. Using timed seroconversion panels, this POC antigen/antibody test has been shown to detect HIV infection just 1 day later than laboratory-based antigen/antibody tests. However, it has lower specificity than laboratory-based antigen/antibody tests; therefore, false positive results are more likely than with laboratory-based tests.[1]

- Antibody-only immunoassays: Many antibody-only immunoassays in current use can be performed using blood from a finger stick or oral fluid and provide results within 30 minutes. Because of this very short turnaround time, they are often referred to as rapid tests. Many of these tests are also approved by the FDA for POC usage. Because these tests detect only antibody, acute HIV infection may be missed.
- HIV NAT: HIV-1 NAT detects HIV viral nucleic acid in blood. Depending on the type of HIV NAT, it may detect acute HIV infection, help diagnose HIV infection, and assess response to HIV therapy. The HIV RNA assay is the preferred NAT for possible acute infection and perinatally acquired infection. Different laboratories may have varying turnaround times for HIV NAT; some require several days before results are available.

- In this section, the term expedited is used to designate testing performed in situations when a very short turnaround time is optimal, such as when the individual is in labor but HIV status is undocumented. Expedited testing should be available in all delivery units 24 hours a day, and results should be available within 1 hour. Expedited testing is dependent on the available HIV tests in each facility and may include any of the three test types. In a setting with low HIV prevalence and/or frequent testing, false positive initial test results will be common. Expedited and/or concurrent NAT can be helpful in managing an initial positive HIV test result. An HIV-1/HIV-2 antibody differentiation assay may be helpful if an antibody response has been mounted.

The Panel on Antiretroviral Therapy and Medical Management of Children Living with HIV and the Panel on Treatment of HIV During Pregnancy and Interventions to Reduce Perinatal HIV Transmission (the Panels) **recommend that clinicians initiate HIV testing with an immunoassay that can detect HIV-1 antibodies, HIV-2 antibodies, and HIV-1 p24 antigen (referred to as an HIV antigen/antibody immunoassay).** The Panels' recommendations for HIV testing are based on the Centers for Disease Control and Prevention's (CDC's) 2014 Laboratory Testing for the Diagnosis of HIV Infection: Updated Recommendations.[2]

Individuals with a reactive antigen/antibody immunoassay should be tested further with an **HIV-1/HIV-2 antibody differentiation assay (referred to as supplemental testing).** Individuals with a reactive antigen/antibody immunoassay and a nonreactive differentiation test should be tested with an FDA-approved plasma HIV RNA assay to assess for acute HIV infection (see the CDC's 2018 Quick Reference Guide: Recommended Laboratory HIV Testing Algorithm for Serum or Plasma Specimens).

In some clinical settings, initial testing may be conducted with a **rapid HIV test,** which may detect a combination of antigen and antibodies or only HIV antibodies. Positive results on POC rapid tests should be followed first by a laboratory-based antigen/antibody assay using serum or plasma and when reactive, followed by a differentiation assay.[3]

Clinicians should assess a pregnant person's risk of acute HIV infection, particularly late in pregnancy, because people may receive a negative result for HIV immunoassays when they are in the window period (the time between infection and when the infection can be detected by a specific laboratory test). The antigen/antibody immunoassay may detect infection as early as 18 days after infection; antibody-only assays may not detect infection until as long as 45 days post-infection. However, during this period, the person with acute HIV will be viremic,[4] with a high risk of perinatal transmission. The HIV RNA assay can detect the presence of HIV as early as 10 days post-infection. **When acute HIV infection is suspected** during pregnancy, during the intrapartum period, or while breastfeeding, **a plasma HIV RNA assay should be performed in conjunction with an antigen/antibody immunoassay.** See Early (Acute and Recent) HIV Infection for more information.

Discordant or False Positive HIV Tests

Discordant HIV testing results can occur, requiring careful evaluation and often repeat tests. Early in HIV infection, before HIV seroconversion, the test combination of a positive antigen/antibody screen, negative HIV-1/HIV-2 antibody differentiation assay, and positive HIV RNA assay may be seen. This combination of results can occur because the immunoglobulin G–based antibody differentiation assay is positive later in infection than the antigen capture or the immunoglobulin M result in the antigen/antibody screen.

False positive results do occur with HIV testing. The frequency of false positive HIV testing is dependent both on the specificity of the assay and the prevalence of HIV in the population, so frequency may vary considerably. In a large urban hospital in Dallas, 21,163 women were screened using a combination antigen/antibody immunoassay. Reactive initial screens were followed by supplemental testing recommended by the CDC algorithm. Of the 190 who tested positive, 28 were determined to have a false positive HIV test, yielding a positive predictive value of 83% (95% confidence interval [CI], 77% to 88%) and a false positive rate of 0.16% (95% CI, 0.11% to 0.22%), using the ARCHITECT HIV Ag/Ab assay.[5] For women screened a second time in pregnancy, the rate of false positive results relative to true positive results may be higher, as it depends on the community risk of HIV acquisition over a short time period (i.e., the 6 months between first- and third-trimester testing).

For any positive HIV screen late in pregnancy, during labor, or immediately postpartum, an HIV RNA assay should be done at the same time as the supplemental HIV-1/HIV-2 antibody differentiation assay. The HIV RNA assay will be needed to resolve questions raised by discordant results between the antigen/antibody screen and the antibody differentiation assay.

The combination of a positive HIV antigen/antibody screen with a negative supplemental HIV-1/HIV-2 antibody differentiation assay and a negative HIV RNA assay is seen in people without HIV who have a false positive antigen/antibody screen.

Timing and Benefits of HIV Testing Prior to Conception or During Pregnancy

HIV infection should be identified before pregnancy (see Prepregnancy Counseling and Care for Persons of Childbearing Age with HIV) or as early as possible in pregnancy. In the United States, approximately 20% to 34% of infants with perinatal HIV exposure were born to people whose HIV diagnosis was not known before pregnancy.[6] Early diagnosis provides the best opportunity to improve the pregnant person's health and pregnancy outcomes and to prevent infant acquisition of HIV. Universal voluntary HIV testing is recommended as the standard of care for all pregnant people in the United States by the Panels, CDC, American Academy of Pediatrics, American College of Obstetricians and Gynecologists, and U.S. Preventive Services Task Force.[7-11] For pregnant people, HIV testing should be performed wherever a person seeks care (including emergency departments and prenatal clinics) to avoid missed opportunities to identify HIV infection. Repeat HIV testing should be performed in the third trimester for people who are at increased risk of acquiring HIV or who are living in areas of high HIV incidence. Repeat testing is also recommended when pregnant individuals are diagnosed with sexually transmitted infection (STI), or when they show symptoms and signs of acute HIV infection. Pregnant people with unknown or undocumented HIV status who present to care in labor should be tested before delivery or as soon as possible after delivery.[12-15] Because women are more susceptible to HIV acquisition during pregnancy and the postpartum period,[16] HIV testing provides an opportunity for clinicians to initiate a discussion about preventive interventions, including educating and counseling about pre-exposure prophylaxis (PrEP) for a pregnant person who is at risk for acquiring HIV. See Pre-exposure Prophylaxis (PrEP) to Prevent

HIV During Periconception, Antepartum, and Postpartum Periods and guidance available on CDC's Pre-exposure Prophylaxis (PrEP) page for more information.

Determining an individual's HIV status before they become pregnant or during the antenatal period enables:

- People with HIV to receive appropriate antiretroviral therapy (ART) and prophylaxis against opportunistic infections;
- Initiation of treatment to maintain and improve health and to decrease risk of perinatal HIV transmission and transmission to partners[7,17,18];
- Referral of partners for testing, providing an opportunity for treatment initiation by partners testing positive, PrEP initiation by serodifferent partners testing negative, and counseling on other preventive measures (see Pre-exposure Prophylaxis (PrEP) to Prevent HIV During Periconception, Antepartum, and Postpartum Periods);
- Counseling of pregnant people with HIV about recommended modes of delivery based on individualized risks of perinatal transmission of HIV[19-21];
- Provision of an appropriate antiretroviral (ARV) prophylaxis regimen to the newborn to reduce risk of infant HIV acquisition (see Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection);
- Shared decision-making on infant feeding choice, specifically breastfeeding or use of replacement feeding (see Infant Feeding for Individuals with HIV in the United States); *and*
- Early diagnostic evaluation of infants exposed to HIV, as well as testing of other children, to permit prompt initiation of ART and any indicated prophylaxis measures (see Diagnosis of HIV Infection in Infants and Children, Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection, and Table 6. What to Start: Initial Antiretroviral Regimens During Pregnancy for People Who Are Antiretroviral-Naive).[8,22,23]

Finally, all HIV testing should be performed in a manner that is consistent with state and local regulations. The CDC recommends the "opt-out" approach, which is allowed in many jurisdictions and involves notifying a pregnant person that HIV testing will be performed as part of routine care unless they choose not to be tested.[7] The "opt-in" approach involves obtaining specific consent before testing, and this approach has been associated with lower testing rates.[24,25] Despite the guidelines for universal HIV screening of pregnant people, recent studies indicate that fewer than 80% of women report having been tested for HIV during pregnancy.[26,27] The mandatory newborn HIV testing approach, which has been adopted by several states, involves testing newborns with or without consent of the birthing parent. In some areas, this applies to all newborns; in others, it applies only when the birthing parent of the newborn has declined prenatal or intrapartum testing.

Repeat HIV Testing in the Third Trimester

Repeat HIV testing during the third trimester, before 36 weeks of gestation, is recommended for people with negative results on their initial HIV tests during pregnancy who:

- Are at high risk of acquiring HIV (i.e., those who inject drugs or have sex with people who inject drugs, those who exchange sex for money or drugs, those who have a sex partner with HIV who has a detectable or unknown HIV viral load, those who have had a new sex partner or more than one sex partner during the current pregnancy,[7] those who have a suspected or diagnosed STI during pregnancy,[10] those who have recently immigrated from a high-burden HIV setting, or

those who have a partner who either recently immigrated from a high-burden HIV setting or recently traveled to such a setting); *or*

- Are receiving health care in facilities where prenatal screening identifies one or more pregnant people with HIV per 1,000 screened or reside in a jurisdiction (state or county) that has an elevated incidence rate of HIV in females aged of 15 to 45 years. An annual HIV diagnosis rate ≥17 per 100,000 females aged 15 to 45 years can be used as a proxy for elevated HIV incidence. Annual state- and county-level HIV diagnosis rates (as a proxy for incidence) by age are available at the CDC's National Center for HIV, Viral Hepatitis, Sexually Transmitted Diseases, and Tuberculosis Prevention AtlasPlus webpage[7,10]; *or*
- Reside in states or territories with statutes or regulations that require third-trimester testing. In a 2020 article, these included Arizona, Connecticut, Delaware, Florida, Georgia, Illinois, Louisiana, Maryland, Nevada, New Jersey, North Carolina, Tennessee, Texas, Virginia, and West Virginia.[28] Clinicians should check current requirements in their jurisdictions; *or*
- Have signs or symptoms of acute HIV (e.g., fever, lymphadenopathy, skin rash, myalgia, headaches, oral ulcers, leukopenia, thrombocytopenia, elevated transaminase levels).[7,10,29,30]
- In addition, third-trimester testing should be offered to pregnant people who perceive themselves as being at increased risk for HIV infection (regardless of whether or not they fit any of the above criteria). Pregnant people who decline testing earlier in pregnancy should be offered testing again during the third trimester.

An antigen/antibody immunoassay should be used for third-trimester testing because these tests have a higher sensitivity in the setting of acute HIV infection than older antibody tests.[2,31] If acute HIV infection is suspected, a plasma HIV RNA assay should be performed in conjunction with an antigen/antibody immunoassay. See Early (Acute and Recent) HIV Infection for more information.

Providers should be proactive in assessing a pregnant person's HIV acquisition risk and implementing third-trimester HIV retesting when indicated. A study in Baltimore found that only 28% of women were retested for HIV despite the high incidence of HIV in Maryland and a high frequency of clinical risk factors.[15] A study of data from 2007 to 2014 on children in Florida with perinatal HIV exposure found that perinatal HIV transmission was associated with poor or late prenatal care, diagnosis of HIV during labor and delivery or after birth, and, in some cases, acute maternal infection (as indicated by negative results for initial tests).[32]

HIV Testing During Labor in People with Unknown HIV Status

People in labor whose HIV status is undocumented and those who tested negative early in pregnancy but are at increased risk of HIV infection and were not retested in the third trimester should undergo expedited HIV testing.[7-9,22,33,34]

- Perform an expedited HIV test—either an antigen/antibody immunoassay that can provide results within 1 hour or the most sensitive rapid test (includes rapid POC tests) available for people in labor. An HIV RNA assay should also be performed for individuals with suspected acute HIV infection. In a setting with low prevalence and/or frequent testing, false positive initial test results will be common. Expedited and/or concurrent NATs can be helpful in managing an initial positive HIV test result.[35]
- If the initial HIV test result is negative (nonreactive), no further testing is required unless acute HIV infection is suspected (see Acute HIV Infection During Pregnancy or Breastfeeding below).[2]

- A positive antigen/antibody immunoassay or rapid HIV test result must be immediately followed by a supplemental HIV-1/HIV-2 antibody differentiation assay, as well as an HIV RNA assay for the birthing parent and an HIV NAT for the infant.[2] If possible, contact the laboratory to prioritize results.
- For delivery units, every effort should be made to have the ability to run a confirmatory supplemental test (HIV-1/HIV-2 antibody differentiation assay) seven days a week. If possible, results of HIV RNA assays should be available in 24 hours or less.
- For individuals with a positive HIV test result or suspected acute HIV infection during labor, provide counseling about HIV test results and implications for care.
    - Initiate IV zidovudine during labor (see Intrapartum Care for People with HIV).
    - Immediately initiate presumptive HIV therapy appropriate for infants who are at high risk of perinatal HIV transmission (see Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection or contact the National Clinician Consultation Center Perinatal HIV/AIDS hotline).
    - For individuals who were planning to breastfeed, the Panel strongly advises against initiating breastfeeding given the high risk of perinatal transmission. Breast milk should be expressed and stored appropriately until all supplemental HIV test results are reviewed and determined to be negative (see Infant Feeding for Individuals with HIV in the United States).

HIV Testing During the Postpartum Period

People who have not been tested for HIV during pregnancy or labor should be offered expedited testing during the immediate postpartum period. Postpartum HIV testing should be done using the antigen/antibody immunoassay to screen for established and acute HIV; results should be obtained in <1 hour. If acute HIV infection is a possibility, then a plasma HIV RNA test should be sent as well. When the birthing parent is unavailable for testing, their newborn should receive HIV testing using an antigen/antibody immunoassay to assess perinatal HIV exposure, understanding that the results reflect the HIV status of the birthing parent. For infants testing positive, an HIV NAT should be sent immediately (see Diagnosis of HIV Infection in Infants and Children).[8,22]

Postpartum individuals who request HIV testing or are at increased risk of HIV acquisition (e.g., those who inject drugs or have sex with people who inject drugs, those who exchange sex for money or drugs, those who have a sex partner with HIV who has a detectable or unknown HIV viral load, those who have had a new sex partner or more than one sex partner during the current pregnancy,[7] those who have a suspected or diagnosed STI during pregnancy,[10] those who have recently immigrated from a high-burden HIV setting, or those who have a partner that either recently immigrated from a high-burden HIV setting or recently traveled to such a setting) should be offered HIV testing and PrEP. See Pre-exposure Prophylaxis (PrEP) to Prevent HIV During Periconception, Antepartum, and Postpartum Periods for more information. If the parent is breastfeeding, consult an HIV specialist regarding frequency of HIV testing in the birthing parent and/or infant.

When an initial HIV test is positive in birthing parents or infants, it is strongly recommended that clinicians initiate presumptive HIV therapy appropriate for infants who are at high risk of perinatal HIV transmission, ideally ≤6 hours after birth (see Antiretroviral Management of Newborns with Perinatal HIV Exposure or Perinatal HIV). The birthing parent should be counseled against breastfeeding pending the results of supplemental testing, which should include a plasma HIV RNA assay. Breast milk can be expressed while HIV diagnostic testing is being completed, but it should not be given to the infant until testing confirms that the birthing parent is HIV negative. If supplemental test results are negative and acute HIV is excluded, infant ARV drugs can be

discontinued. In the absence of ongoing HIV exposure in the birthing parent, breastfeeding can be initiated. Consultation with a pediatric HIV specialist is strongly recommended if questions remain about the potential for acute infection in the birthing parent or ongoing infant risk of HIV exposure.

Infant HIV Testing When the Birthing Parent's HIV Test Results Are Unavailable

When the birthing parent's HIV test results are unavailable (e.g., they declined testing during pregnancy, infant or child is in foster care) or their accuracy cannot be evaluated (e.g., for internationally adopted infants and children), HIV testing of these infants or children is indicated to identify HIV exposure and possible infection.[8] If the birthing parent's HIV test results are unavailable at birth, the newborn should be tested using an expedited antibody test to identify perinatal HIV exposure. If positive, an HIV NAT should be performed on the infant, presumptive HIV therapy appropriate for infants at high risk for perinatal HIV transmission should be initiated immediately (see Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection for guidance), and the birthing parent should be offered standard HIV diagnostic testing as soon as possible. For older infants and children, the choice of test will vary based on the age of the child (see Diagnosis of HIV Infection in Infants and Children).

Acute HIV Infection During Pregnancy or Breastfeeding

Pregnancy and the early postpartum period are times of increased risk for HIV infection.[36] Risk of HIV exposure should be assessed in all people who are considering becoming pregnant, as well as in all pregnant and postpartum people who previously tested negative for HIV, including those who are breastfeeding. People with risk factors for HIV acquisition before, during, and after pregnancy should receive prevention counseling and appropriate interventions, including PrEP if indicated[36,37] (see Prepregnancy Counseling and Care for Persons of Childbearing Age with HIV and Pre-Exposure Prophylaxis [PrEP] to Prevent HIV During Periconception, Antepartum, and Postpartum Periods for more information). People who have acute HIV during pregnancy or lactation have an increased risk of perinatal transmission; acute HIV also increase risk for sexual transmission of HIV (see Early [Acute and Recent] HIV Infection).[38-42] The antigen/antibody immunoassay will detect acute HIV infection earlier than other immunoassays—within approximately 18 days of acquisition. When acute HIV infection is suspected, a plasma HIV RNA test should be sent as well as the antigen/antibody test, because virologic tests can detect the presence of HIV approximately 5 days earlier than the antigen/antibody immunoassay. People with possible acute HIV infection who are breastfeeding should cease breastfeeding immediately until HIV infection is confirmed or excluded.[43] Breast milk can be expressed while HIV diagnostic testing is completed. Breastfeeding can resume if HIV infection is excluded and there is no ongoing risk. Care of pregnant or breastfeeding people with acute or early HIV, and their infants, should follow the recommendations in the Perinatal Guidelines (see Early [Acute and Recent] HIV Infection, Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection, and Infant Feeding for Individuals with HIV in the United States).

Other Issues

Clinicians should be aware of public health surveillance systems and regulations that may exist in their jurisdictions for reporting infants who have been exposed to HIV; this is in addition to mandatory reporting of people with HIV, including infants. Reporting infants who have been exposed to HIV allows the appropriate public health functions to be accomplished.

References

1. Delaney KP, Hanson DL, Masciotra S, et al. Time until emergence of HIV test reactivity following infection with HIV-1: implications for interpreting test results and retesting after exposure. *Clin Infect Dis*. 2017;64(1):53-59. Available at: https://pubmed.ncbi.nlm.nih.gov/27737954.

2. Branson BM, Owen SM, Wesolowski LG, et al. Laboratory testing for the diagnosis of HIV infection: updated recommendations. 2014. Available at: http://stacks.cdc.gov/view/cdc/23447.

3. Centers for Disease Control and Prevention. Technical update : Use of the Determine HIV 1/2 Ag/Ab combo test with serum or plasma in the laboratory algorithm for HIV diagnosis. 10/4/2017 2017.Available at: https://stacks.cdc.gov/view/cdc/48472.

4. Centers for Disease Control and Prevention and Association of Public Health Laboratories. Laboratory testing for the diagnosis of HIV infection: updated recommendations. June 27, 2014 2014.Available at: http://dx.doi.org/10.15620/cdc.23447. Accessed.

5. Adhikari EH, Macias D, Gaffney D, et al. Diagnostic accuracy of fourth-generation ARCHITECT HIV Ag/Ab Combo assay and utility of signal-to-cutoff ratio to predict false-positive HIV tests in pregnancy. *Am J Obstet Gynecol*. 2018;219(4):408 e401-408 e409. Available at: https://pubmed.ncbi.nlm.nih.gov/29913173.

6. Nesheim SR, FitzHarris LF, Mahle Gray K, Lampe MA. Epidemiology of perinatal HIV transmission in the United States in the era of its elimination. *Pediatr Infect Dis J*. 2019;38(6):611-616. Available at: https://pubmed.ncbi.nlm.nih.gov/30724833.

7. Branson BM, Handsfield HH, Lampe MA, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep*. 2006;55(RR-14):1-17; quiz CE11-14. Available at: https://pubmed.ncbi.nlm.nih.gov/16988643.

8. Chadwick EG, Ezeanolue EE, Committee On Pediatric A. Evaluation and management of the infant exposed to HIV in the United States. *Pediatrics*. 2020;146(5). Available at: https://pubmed.ncbi.nlm.nih.gov/33077537.

9. Chou R, Cantor AG, Zakher B, Bougatsos C. Screening for HIV in pregnant women: systematic review to update the 2005 U.S. Preventive Services Task Force recommendation. *Ann Intern Med*. 2012;157(10):719-728. Available at: https://pubmed.ncbi.nlm.nih.gov/23165663.

10. American College of Obstetricians Gynecologists, Committee on Obstetric Practice HIV Expert Work Group. ACOG committee opinion no. 752: prenatal and perinatal human immunodeficiency virus testing. *Obstet Gynecol*. 2018;132(3):e138-e142. Available at: https://pubmed.ncbi.nlm.nih.gov/30134428.

11. U.S. Preventive Services Task Force, Owens DK, Davidson KW, et al. Screening for HIV infection: US preventive services task force recommendation statement. *JAMA*. 2019;321(23):2326-2336. Available at: https://pubmed.ncbi.nlm.nih.gov/31184701.

12. Whitmore SK, Taylor AW, Espinoza L, et al. Correlates of mother-to-child transmission of HIV in the United States and Puerto Rico. *Pediatrics*. 2012;129(1):e74-81. Available at: https://pubmed.ncbi.nlm.nih.gov/22144694.

13. Ezeanolue EE, Pharr JR, Hunt A, et al. Why are children still being infected with HIV? Impact of an integrated public health and clinical practice intervention on mother-to-child HIV transmission in Las Vegas, Nevada, 2007–2012. *Ann Med Health Sci Res*. 2015;5(4):253-259. Available at: https://pubmed.ncbi.nlm.nih.gov/26229713.

14. Taylor AW, Nesheim SR, Zhang X, et al. Estimated perinatal HIV infection among infants born in the United States, 2002-2013. *JAMA Pediatr*. 2017;171(5):435-442. Available at: https://pubmed.ncbi.nlm.nih.gov/28319246.

15. Liao C, Golden WC, Anderson JR, Coleman JS. Missed opportunities for repeat HIV testing in pregnancy: implications for elimination of mother-to-child transmission in the United States. *AIDS Patient Care STDS*. 2017;31(1):20-26. Available at: https://pubmed.ncbi.nlm.nih.gov/27936863.

16. Thomson KA, Hughes J, Baeten JM, et al. Increased risk of HIV acquisition among women throughout pregnancy and during the postpartum period: a prospective per-coital-act analysis among women with HIV-infected partners. *J Infect Dis*. 2018;218(1):16-25. Available at: https://pubmed.ncbi.nlm.nih.gov/29514254.

17. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med*. 2011;365(6):493-505. Available at: https://pubmed.ncbi.nlm.nih.gov/21767103.

18. Baggaley RF, White RG, Hollingsworth TD, Boily MC. Heterosexual HIV-1 infectiousness and antiretroviral use: systematic review of prospective studies of discordant couples. *Epidemiology*. 2013;24(1):110-121. Available at: https://pubmed.ncbi.nlm.nih.gov/23222513.

19. Jamieson DJ, Read JS, Kourtis AP, et al. Cesarean delivery for HIV-infected women: recommendations and controversies. *Am J Obstet Gynecol*. 2007;197(3 Suppl):S96-100. Available at: https://pubmed.ncbi.nlm.nih.gov/17825656.

20. Tubiana R, Le Chenadec J, Rouzioux C, et al. Factors associated with mother-to-child transmission of HIV-1 despite a maternal viral load <500 copies/ml at delivery: a case-control study nested in the French Perinatal Cohort (EPF-ANRS CO1). *Clin Infect Dis*. 2010;50(4):585-596. Available at: https://pubmed.ncbi.nlm.nih.gov/20070234.

21. Townsend CL, Cortina-Borja M, Peckham CS, et al. Low rates of mother-to-child transmission of HIV following effective pregnancy interventions in the United Kingdom and Ireland, 2000–2006. *AIDS*. 2008;22(8):973-981. Available at: https://pubmed.ncbi.nlm.nih.gov/18453857.

22. Havens PL, Mofenson LM, American Academy of Pediatrics Committee on Pediatric A. Evaluation and management of the infant exposed to HIV-1 in the United States. *Pediatrics*. 2009;123(1):175-187. Available at: https://pubmed.ncbi.nlm.nih.gov/19117880.

23. Hegazi A, Forsyth S, Prime K, Bashh Adolescent Special Interest Group. Testing the children of HIV-infected parents: 6 years on from 'Don't forget the children'. *Sex Transm Infect*. 2015;91(2):76-77. Available at: https://pubmed.ncbi.nlm.nih.gov/25316913.

24. Boer K, Smit C, van der Flier M, et al. The comparison of the performance of two screening strategies identifying newly-diagnosed HIV during pregnancy. *Eur J Public Health*. 2011;21(5):632-637. Available at: https://pubmed.ncbi.nlm.nih.gov/21051473.

25. Yudin MH, Moravac C, Shah RR. Influence of an "opt-out" test strategy and patient factors on human immunodeficiency virus screening in pregnancy. *Obstet Gynecol*. 2007;110(1):81-86. Available at: https://pubmed.ncbi.nlm.nih.gov/17601900.

26. Olakunde BO, Pharr JR, Adeyinka DA. HIV testing among pregnant women with prenatal care in the United States: An analysis of the 2011–2017 National Survey of Family Growth. *Int J STD AIDS*. 2020;31(7):680-688. Available at: https://pubmed.ncbi.nlm.nih.gov/32538331.

27. Koumans EH, Harrison A, House LD, et al. Characteristics associated with lack of HIV testing during pregnancy and delivery in 36 U.S. states, 2004–2013. *Int J STD AIDS*. 2018;29(12):1225-1233. Available at: https://pubmed.ncbi.nlm.nih.gov/29969977.

28. Salvant Valentine S, Caldwell J, Tailor A. Effect of CDC 2006 revised HIV testing recommendations for adults, adolescents, pregnant women, and newborns on state laws, 2018. *Public Health Rep*. 2020;135(1_suppl):189S-196S. Available at: https://pubmed.ncbi.nlm.nih.gov/32735201.

29. Sansom SL, Jamieson DJ, Farnham PG, et al. Human immunodeficiency virus retesting during pregnancy: costs and effectiveness in preventing perinatal transmission. *Obstet Gynecol*. 2003;102(4):782-790. Available at: https://pubmed.ncbi.nlm.nih.gov/14551009.

30. Richey LE, Halperin J. Acute human immunodeficiency virus infection. *Am J Med Sci*. 2013;345(2):136-142. Available at: https://pubmed.ncbi.nlm.nih.gov/23095473.

31. Panel on Antiretroviral Guidelines for Adults and Adolescents. Guidelines for the use of antiretroviral agents in adults and adolescents with HIV. 2023. Available at: https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-arv/whats-new.

32. Trepka MJ, Mukherjee S, Beck-Sague C, et al. Missed opportunities for preventing perinatal transmission of human immunodeficiency virus, Florida, 2007–2014. *South Med J*. 2017;110(2):116-128. Available at: https://pubmed.ncbi.nlm.nih.gov/28158882.

33. Yee LM, Miller ES, Statton A, et al. Sustainability of statewide rapid HIV testing in labor and delivery. *AIDS Behav*. 2018;22(2):538-544. Available at: https://pubmed.ncbi.nlm.nih.gov/28986656.

34. Scott RK, Crochet S, Huang CC. Universal rapid human immunodeficiency virus screening at delivery: a cost-effectiveness analysis. *Infect Dis Obstet Gynecol*. 2018;2018:6024698. Available at: https://pubmed.ncbi.nlm.nih.gov/29731602.

35. Wesolowski LG, Delaney KP, Lampe MA, Nesheim SR. False-positive human immunodeficiency virus enzyme immunoassay results in pregnant women. *PLoS One*. 2011;6(1):e16538. Available at: https://pubmed.ncbi.nlm.nih.gov/21304592.

36. Thomson KA, Hughes J, Baeten JM, et al. Increased risk of HIV acquisition among women throughout pregnancy and during the postpartum period: a prospective per-coital-act analysis among women with HIV-infected partners. *J Infect Dis*. 2018;218(1):16-25. Available at: https://pubmed.ncbi.nlm.nih.gov/29514254.

37. Graybill LA, Kasaro M, Freeborn K, et al. Incident HIV among pregnant and breast-feeding women in sub-Saharan Africa: a systematic review and meta-analysis. *AIDS*. 2020;34(5):761-776. Available at: https://pubmed.ncbi.nlm.nih.gov/32167990/.

38. Lockman S, Creek T. Acute maternal HIV infection during pregnancy and breast-feeding: substantial risk to infants. *J Infect Dis*. 2009;200(5):667-669. Available at: https://pubmed.ncbi.nlm.nih.gov/19627246.

39. Taha TE, James MM, Hoover DR, et al. Association of recent HIV infection and in-utero HIV-1 transmission. *AIDS*. 2011;25(11):1357-1364. Available at: https://pubmed.ncbi.nlm.nih.gov/21572305.

40. Humphrey JH, Marinda E, Mutasa K, et al. Mother to child transmission of HIV among Zimbabwean women who seroconverted postnatally: prospective cohort study. *BMJ*. 2010;341:c6580. Available at: https://pubmed.ncbi.nlm.nih.gov/21177735.

41. Drake AL, Wagner A, Richardson B, John-Stewart G. Incident HIV during pregnancy and postpartum and risk of mother-to-child HIV transmission: a systematic review and meta-analysis. *PLoS Med*. 2014;11(2):e1001608. Available at: https://pubmed.ncbi.nlm.nih.gov/24586123.

42. Birkhead GS, Pulver WP, Warren BL, et al. Acquiring human immunodeficiency virus during pregnancy and mother-to-child transmission in New York: 2002-2006. *Obstet Gynecol*. 2010;115(6):1247-1255. Available at: https://pubmed.ncbi.nlm.nih.gov/20502297.

43. Committee on Pediatric AIDS. Infant feeding and transmission of human immunodeficiency virus in the United States. *Pediatrics*. 2013;131(2):391-396. Available at: https://pubmed.ncbi.nlm.nih.gov/23359577.