Recommendations for the Use of Antiretroviral Drugs During Pregnancy and Interventions to Reduce Perinatal HIV Transmission in the United States
Maternal HIV Testing and Identification of Perinatal HIV Exposure

Panel's Recommendations

- HIV testing is recommended as a standard of care for all sexually active people and should be a routine component of preconception care (AII).
- All pregnant people should be tested as early as possible during each pregnancy (see Laboratory Testing for the Diagnosis of HIV Infection: Updated Recommendations and 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 women per year, those who reside in jurisdictions with elevated HIV incidence (see Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings from CDC), or those who reside in states or territories that require third-trimester testing (AII).
- Repeat HIV testing is recommended for pregnant people with a sexually transmitted infection (STI) or with signs and symptoms of acute HIV infection, or ongoing exposure to HIV, as well as referral for initiation of pre-exposure prophylaxis if HIV testing is negative (AIII). See Pre-Exposure Prophylaxis (PrEP) to Prevent HIV During Periconception, Antepartum, and Postpartum Periods for more information.
- Expedited HIV testing should be performed during labor or 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). Testing should be available 24 hours a day, and results should be available within 1 hour. If results are positive, intrapartum antiretroviral (ARV) prophylaxis should be initiated immediately (AI).
- Pregnant people who were not tested for HIV before or during labor should undergo expedited HIV antibody testing during the immediate postpartum period (or their newborns should undergo expedited HIV antibody testing) (AII).
- When a pregnant person has a positive HIV test result during labor and delivery or postpartum, or when a newborn’s expedited antibody test is positive, an appropriate infant ARV drug regimen should be initiated immediately, and the infant should not be breastfed while awaiting the results of supplemental HIV testing (AII). See Antiretroviral Management of Newborns with Perinatal HIV Exposure or Perinatal HIV for guidance.
- Results of maternal HIV testing should be documented in the newborn’s medical record and communicated to the newborn’s primary care provider (AIII).
- HIV testing is recommended for infants and children in foster care and adoptees for whom maternal HIV status is unknown to identify perinatal HIV exposure and possible HIV infection (AIII) (see Diagnosis of HIV Infections in Infants and Children).

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 post-pubertal adolescents
Prepregnancy Counseling and Care for Persons of Childbearing Age with HIV

(Last updated December 30, 2021; last reviewed December 30, 2021)

Panel’s Recommendations

- Discuss reproductive desires with all persons of childbearing potential on an ongoing basis throughout the course of their care (AIII).
- Provide information about effective and appropriate contraceptive methods to people who do not currently desire pregnancy (AI).
- During prepregnancy counseling, provide information on safe sex; ask about the use of alcohol, nicotine products, and drugs of abuse (AII).
- Persons with HIV should attain maximum viral suppression before attempting conception, for their own health, to prevent sexual HIV transmission to partners without HIV (AI), and to minimize the risk of in utero HIV transmission to the infant (AI).
- When selecting or evaluating an antiretroviral (ARV) regimen for persons of childbearing potential with HIV, consider a regimen’s effectiveness, a person’s hepatitis B status, and the possible adverse outcomes for the pregnant person and their fetus (AII). See Teratogenicity and Recommendations for Use of Antiretroviral Drugs During Pregnancy for more information. The Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission (the Panel) emphasizes the importance of counseling and shared decision-making regarding all ARV regimens for persons with HIV (AIII).
- HIV infection does not preclude the use of any contraceptive method; however, drug-drug interactions between hormonal contraceptives, ARVs, and other medications should be considered (see Table 3) (AII).

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

Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Panel's Recommendations

- Health care providers should offer and promote daily oral combination tenofovir disoproxil fumarate/emtricitabine (TDF/FTC) pre-exposure prophylaxis (PrEP), when indicated, for uninfected individuals who are trying to conceive or are pregnant, postpartum, or breastfeeding to prevent HIV acquisition (AII). Indications for PrEP include risk factors for acquiring HIV, such as condomless sex with a partner with HIV whose HIV-RNA level is detectable or unknown, recent sexually transmitted infection (STI), or injection drug use. Because risk factors may be underreported, health care providers should discuss PrEP with those with behaviors or experiences that can be associated with HIV, such as intimate partner violence, repeated post-exposure prophylaxis courses, or reporting feeling at risk for HIV acquisition.

- People who become pregnant while using TDF/FTC as PrEP can continue PrEP throughout their pregnancy. Risk for HIV acquisition should be reassessed, and people should be counseled regarding benefits and risks of PrEP use in pregnancy (AII).

- Providers should counsel patients about the benefits of PrEP to prevent HIV acquisition and perinatal transmission (AI) and about potential risks of PrEP during periconception, pregnancy, postpartum, and breastfeeding periods (AII).

- In cases when the individual’s risk factor is one identified partner with HIV and that partner is on antiretroviral therapy (ART) with sustained viral suppression, condomless sexual intercourse is associated with effectively no risk of sexual HIV transmission when HIV viral load is suppressed (AI) (see Reproductive Options for Couples When One or Both Partners Have HIV).

- Providers should counsel patients about the importance of daily adherence to oral TDF/FTC PrEP to prevent HIV acquisition (AI). Patients should be counseled to continue additional protection for the first 20 days after initiating PrEP and for 28 days after last potential vaginal exposure (BII). No available data support on-demand PrEP use for people exposed to HIV through vaginal exposure.

- Providers should offer routine PrEP follow-up, including testing for HIV every 3 months and counseling on signs and symptoms of acute retroviral syndrome (AI) (see the Centers for Disease Prevention and Control Guidelines for HIV Pre-Exposure Prophylaxis and Maternal HIV Testing and Identification of Perinatal HIV Exposure). More frequent testing may be appropriate when clinically indicated (e.g., adherence challenges, nonstandard visit schedule).

Dapivirine vaginal ring and injectable cabotegravir have been shown to reduce the risk of HIV acquisition via receptive vaginal exposure, and cabotegravir has been approved by the U.S. Food and Drug Administration (FDA) for use as PrEP in people with exposure to HIV. However, safety data are limited for their use during conception, pregnancy, or breastfeeding. Oral tenofovir alafenamide (TAF)/FTC has not been demonstrated to be effective for HIV prevention in people with receptive vaginal exposure.

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

Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
### Panel’s Recommendations

**For People Who Want to Conceive When One or Both Partners Have HIV**

- Expert consultation is recommended to tailor guidance to an individual’s specific needs (AIII).
- People with HIV should achieve sustained viral suppression (e.g., two recorded measurements of plasma viral loads that are below the limits of detection at least 3 months apart) before attempting conception to maximize their health, prevent HIV sexual transmission (AI) and—for pregnant people with HIV—minimize the risk of HIV transmission to their infants (AI).
- Both persons should be screened and treated for genital tract infections before attempting to conceive (AII).
- When people have different HIV statuses, sexual intercourse without a condom allows conception with effectively no risk of sexual HIV transmission to the person without HIV if the person with HIV is on antiretroviral therapy (ART) and has achieved sustained viral suppression (BII).
- Additional guidance might be required in the following scenarios:
  - The person with HIV has not achieved sustained viral suppression or their HIV viral suppression status is unknown,
  - Concerns exist that the person with HIV might be inconsistently adherent to ART during the periconception period, or
  - The provider wishes to share additional information regarding options to prevent sexual HIV transmission during the periconception period.
- In these circumstances, providers can choose to provide counseling about the following options:
  - Administration of antiretroviral pre-exposure prophylaxis (PrEP) to the partner without HIV reduces the risk of sexual acquisition of HIV (AI) (see Pre-Exposure Prophylaxis (PrEP) to Prevent HIV During Periconception, Antepartum, and Postpartum Periods). When partners with different HIV statuses attempt conception, the partner without HIV can choose to take PrEP even if the partner with HIV has achieved viral suppression (CIII).
  - Consider advising timing condomless sex to coincide with ovulation (peak fertility) in order to reduce HIV transmission risk and to optimize the probability of conception (CIII).

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Antepartum Care

(Last updated December 30, 2021; last reviewed December 30, 2021)

General Principles Regarding Use of Antiretroviral Drugs During Pregnancy

<table>
<thead>
<tr>
<th>Panel’s Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Initial evaluation of pregnant people with HIV should include an assessment of HIV disease status and plans to initiate, continue, or modify antiretroviral therapy (ART) (AI). The National Perinatal HIV Hotline (1-888-448-8765) provides free clinical consultation on all aspects of perinatal HIV care.</td>
</tr>
<tr>
<td>• All pregnant people with HIV should initiate ART as early in pregnancy as possible, regardless of their HIV RNA level or CD4 T lymphocyte count, to maximize their health and prevent perinatal HIV transmission and secondary sexual transmission (AI). Persons with HIV should maintain an HIV viral load that is below the limit of detection during pregnancy, postpartum, and throughout their lives (AII).</td>
</tr>
<tr>
<td>• Antiretroviral (ARV) drug-resistance genotype evaluations or assays should be performed before starting ARV drug regimens in people who are ARV-naive (AII) or ARV-experienced (AIII) and before modifying ARV drug regimens (AII) in people whose HIV RNA levels are above the threshold for resistance testing (i.e., &gt;500 copies/mL to 1,000 copies/mL).</td>
</tr>
<tr>
<td>• In pregnant people who are not already receiving ART, ART should be initiated before results of drug-resistance testing are available because earlier viral suppression has been associated with lower risk of transmission. When ART is initiated before results are available, the regimen should be modified, if necessary, based on resistance assay results (AII).</td>
</tr>
<tr>
<td>• To minimize the risk of perinatal transmission, people with HIV should receive ART throughout pregnancy (including the intrapartum period), and neonates should receive appropriate ARV drugs (AI). See Recommendations for Use of Antiretroviral Drugs During Pregnancy and Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection.</td>
</tr>
<tr>
<td>• People with HIV should be counseled on the known benefits and potential risks of all medications, including ARV drugs used during pregnancy and postpartum, as well as the importance of ART adherence (AIII).</td>
</tr>
<tr>
<td>• If an ARV drug regimen must be stopped during pregnancy (e.g., for severe toxicity), all ARV drugs should be stopped simultaneously, and a complete, effective ARV regimen should be reinitiated as soon as possible (AII).</td>
</tr>
<tr>
<td>• Coordination of services among prenatal care providers, primary care and HIV specialty care providers, and, when appropriate, mental health and substance use disorder treatment services, intimate partner violence support services, and public assistance programs is essential to support and enable adherence to medication (AII).</td>
</tr>
<tr>
<td>• Providers should initiate counseling about key intrapartum and postpartum considerations during pregnancy, including mode of delivery, lifelong HIV therapy, family planning and contraceptive options, infant feeding, infant ARV prophylaxis, and timing of infant diagnostic testing (AIII).</td>
</tr>
</tbody>
</table>

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

Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
## Panel’s Recommendations

- All cases of antiretroviral (ARV) drug exposure during pregnancy should be reported to the [Antiretroviral Pregnancy Registry](http://www.pregnancyregistry.org) (AIII).

- Based on multiple studies indicating no difference in rates of total birth defects for first-trimester exposure compared with later ARV drug exposures, persons can be counseled that ARV drugs during pregnancy generally do not increase the risk of birth defects (BIII). Providers should be aware that data on the risks of birth defects for many ARV drugs are limited and evolving.
  - With further data, the initial concerning signal for neural tube defects (NTDs) with dolutegravir (DTG) use during the preconception period has decreased substantially. Based on the available evidence, the Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal HIV Transmission (the Panel) recommends DTG as a Preferred drug for pregnant people, irrespective of trimester (AII), and for people who are trying to conceive (AIII).

- The Panel emphasizes the importance of counseling and informed decision-making regarding all ARV regimens for people with HIV (AIII). For additional information, see [Appendix C: Antiretroviral Counseling Guide for Health Care Providers](#).

- Clinicians should discuss future reproductive plans and timing, the risks, and benefits of conceiving on specific ARV medications and the use of appropriate contraceptive options to prevent unintended pregnancies (AIII).

- Folic acid is known to prevent NTDs. All pregnant people and people who might conceive should take at least 400 mcg of folic acid daily (AII). For additional information, see [Recommendations for Use of Antiretroviral Drugs During Pregnancy, Prepregnancy Counseling and Care for Persons of Childbearing Age with HIV, and Pregnant People with HIV Who Are Currently Receiving Antiretroviral Therapy](#).

---

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion

---

**Recommendations for the Use of Antiretroviral Drugs During Pregnancy and Interventions to Reduce Perinatal HIV Transmission in the United States**

6
Antiretroviral Drug Regimens and Maternal and Neonatal Outcomes

(Last updated December 30, 2021; last reviewed December 30, 2021)

<table>
<thead>
<tr>
<th>Panel's Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Clinicians should be aware of a possible increased risk of adverse neonatal outcomes (e.g., preterm delivery) in pregnant people who are receiving antiretroviral therapy (ART). However, given the clear benefits of ART for both maternal health and the prevention of perinatal transmission, HIV treatment should not be withheld due to concern for adverse pregnancy outcomes (AII).</td>
</tr>
</tbody>
</table>

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Panel’s Recommendations

- When choosing an antiretroviral (ARV) drug regimen for use in pregnant people, providers and patients should consider multiple factors, including adverse effects, drug interactions, pharmacokinetics (PKs), convenience of the individual drugs and drug combinations in the regimen, available pregnancy safety and outcome data, virologic efficacy in nonpregnant adults, and the patient’s resistance test results and comorbidities (AIII).

- The same regimens that are recommended for the treatment of nonpregnant adults should be used in pregnant people when sufficient data suggest that appropriate drug exposure is achieved during pregnancy; clinicians should weigh the risks of adverse effects for pregnant people, fetuses, or infants against the benefits of these regimens and recognize that safety data of ARV drugs in pregnancy are often incomplete (AII). For more information, see Table 4 and Table 5.

- In most cases, people who present for obstetric care on fully suppressive ARV regimens should continue their current regimens (AIII).

- PK changes in pregnancy may lead to lower plasma levels of some ARV drugs and necessitate increased doses, more frequent dosing, boosting, more frequent viral load monitoring, or a change in ARV regimen; see Pregnant People with HIV Who Are Currently Receiving Antiretroviral Therapy (AII).

- The Panel emphasizes the importance of counseling and informed decision-making regarding all ARV regimens for people with HIV (AIII). For additional information, see Prepregnancy Counseling and Care for Persons of Childbearing Age with HIV, Teratogenicity, Appendix C: Antiretroviral Counseling Guide for Health Care Providers, and Table 4 and Table 5.

- After delivery, clinicians should discuss reproductive desires, the risks and benefits of conceiving on the current ARV regimen, and contraceptive options (AII). See Prepregnancy Counseling and Care for Persons of Childbearing Age with HIV and Postpartum Follow-Up for more information.

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

Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Panel’s Recommendations

- Antiretroviral therapy (ART) is recommended for all pregnant people with HIV to reduce the risk of perinatal HIV transmission and to optimize the health of the pregnant person (AI). Initiating ART as soon as possible in pregnant people who have never received antiretroviral (ARV) drugs is recommended, based on data demonstrating that earlier virologic suppression is associated with a lower risk of perinatal HIV transmission (AII).

- The results of ARV drug-resistance studies should guide the selection of ARV regimens in people whose HIV RNA levels are above the threshold for resistance testing (i.e., >500 copies/mL to 1,000 copies/mL) (see Antiretroviral Drug Resistance and Resistance Testing in Pregnancy (AII). However, ART initiation should not be delayed while awaiting results of resistance testing. When ART is initiated before the results of the drug-resistance assays are available, the ARV regimen should be modified, if necessary, based on the resistance assay results (AII).

- ARV regimens that are Preferred for the treatment of pregnant people with HIV who are ARV-naive include a dual-nucleoside reverse transcriptase inhibitor combination (abacavir plus lamivudine [3TC], tenofovir disoproxil fumarate plus either emtricitabine [FTC] or 3TC, or tenofovir alafenamide plus either FTC or 3TC) and either a ritonavir-boosted protease inhibitor (atazanavir/ritonavir or darunavir/ritonavir) or an integrase strand transfer inhibitor (dolutegravir [irrespective of trimester] or raltegravir) (see Table 4 and Recommendations for Use of Antiretroviral Drugs During Pregnancy (AIII).

- The Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal HIV (the Panel) emphasizes the importance of counseling and informed decision-making with regard to all ARV regimens for pregnant people with HIV (AIII). See Appendix C: Antiretroviral Counseling Guide for Health Care Providers for more information.

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Panel's Recommendations

- People with HIV who are receiving antiretroviral therapy (ART) and who present for pregnancy care should continue their ART during pregnancy, provided that the regimen is tolerated, safe, and effective in suppressing viral replication (defined as a regimen that maintains an HIV viral load less than lower limits of detection of the assay) (AII).

- When considering changes in ART during pregnancy, the Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission recommends patient counseling to support informed decision-making (AIII). See Appendix C: Antiretroviral Counseling Guide for Health Care Providers.

- Persons who present during pregnancy on drugs that are not recommended for use because of toxicity (e.g., stavudine, didanosine) should stop taking these drugs and be switched to other antiretroviral (ARV) drugs that are recommended for use during pregnancy (AII). See Table 5: Situation-Specific Recommendations for Use of Antiretroviral Drugs in Pregnant People and Nonpregnant People Who Are Trying to Conceive for more information.

- Although there are no data on the use of two-drug oral regimens during pregnancy (e.g., dolutegravir [DTG] plus lamivudine [3TC], DTG plus rilpivirine [RPV]), the component drugs are recommended for use in pregnancy. Pregnant persons who present to care on DTG/3TC or DTG/RPV and have successfully maintained viral suppression can continue the two-drug regimen with more frequent viral load monitoring, every 1 to 2 months throughout pregnancy (CIII).

- Because data about the use of long-acting injectable cabotegravir (CAB) and RPV during pregnancy are extremely limited, pregnant persons who present to care on this regimen should be switched to one of the Preferred or Alternative three-drug ARV regimens (CIII).

- The use of atazanavir/cobicistat, darunavir/cobicistat, or elvitegravir/cobicistat regimens during pregnancy is associated with lower plasma drug exposures due to physiologic changes associated with pregnancy. These lower drug exposures pose an increased risk of virologic failure during the second and third trimesters of pregnancy (see Table 4: What to Start: Initial Antiretroviral Regimens During Pregnancy for People Who Are Antiretroviral-Naive and Table 5: Situation-Specific Recommendations for Use of Antiretroviral Drugs in Pregnant People and Nonpregnant People Who Are Trying to Conceive). When a pregnant person presents to care on one of these regimens, providers should decide whether to continue the regimen or to switch to a different regimen that is recommended for use during pregnancy (BIII). If one of these regimens is continued, absorption should be optimized by taking the drugs with food, and viral load should be monitored frequently (i.e., every 1–2 months).

- If an ARV regimen is altered during pregnancy, drugs in the new regimen should include ARV drugs that are recommended for use in pregnancy (see Table 4: What to Start: Initial Antiretroviral Regimens During Pregnancy for People Who Are Antiretroviral-Naive and Table 5: Situation-Specific Recommendations for Use of Antiretroviral Drugs in Pregnant People and Nonpregnant People Who Are Trying to Conceive) (BIII), and more frequent virologic monitoring is warranted (CIII).

- ARV drug-resistance testing should be performed to assist the selection of active drugs when changing ARV regimens in pregnant people who are experiencing virologic failure on ART and who have HIV RNA levels >500 copies/mL to 1,000 copies/mL (AII). In individuals who have HIV RNA levels >500 copies/mL but <1,000 copies/mL, testing may be unsuccessful but still should be considered (BII). See Pregnant People Who Have Not Achieved Viral Suppression on Antiretroviral Therapy for more information.

- Clinicians should discuss future reproductive plans and timing, the risks and benefits of conceiving on specific ARV medications, and use of appropriate contraceptive options to prevent unintended pregnancy (AIII).

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

Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Pregnant People with HIV Who Have Previously Received Antiretroviral Medications but Are Not Currently Receiving Any Antiretroviral Medications

(Last updated December 30, 2021; last reviewed December 30, 2021)

<table>
<thead>
<tr>
<th>Panel's Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Obtain an accurate history of all prior antiretroviral (ARV) medications used for HIV treatment or prevention of HIV transmission, including virologic efficacy, patient’s tolerance of the medications, results of prior resistance testing, and problems with adherence (AIII).</td>
</tr>
<tr>
<td>• Choose and initiate an antiretroviral therapy (ART) regimen based on results of prior resistance testing, prior ARV drug use, concurrent medical conditions, and current recommendations for ART in pregnancy (see Table 5) (AII).</td>
</tr>
<tr>
<td>• If HIV RNA is above the threshold for standard genotypic drug resistance testing (i.e., &gt;500 to 1,000 copies/mL), ARV drug-resistance testing should be performed prior to starting an ARV drug regimen (see Antiretroviral Drug Resistance and Resistance Testing in Pregnancy) (AIII).</td>
</tr>
<tr>
<td>• ART should be initiated prior to receiving results of current ARV resistance assays. ART should be modified based on the results of the resistance assay, if necessary (AII).</td>
</tr>
<tr>
<td>• If the ART regimen results in insufficient viral suppression, repeat resistance testing and assess other considerations, including adherence, food requirements, and drug interactions (AII).</td>
</tr>
<tr>
<td>• Consider consulting with an HIV treatment specialist when choosing an ART regimen for patients who previously received ARV drugs or modifying ART for those who are not fully suppressed (BIII).</td>
</tr>
</tbody>
</table>

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
## Monitoring During Pregnancy

(Last updated December 30, 2021; last reviewed December 30, 2021)

<table>
<thead>
<tr>
<th>Panel’s Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>•</strong> The plasma HIV RNA levels of pregnant people with HIV should be monitored at the initial antenatal visit (AI), 2 to 4 weeks after initiating (or changing) antiretroviral therapy (ART) (BI), monthly until RNA levels are undetectable (BII), and then at least every 3 months during pregnancy (BIII). HIV RNA levels also should be assessed at approximately 34 to 36 weeks gestation to inform decisions about mode of delivery (see Intrapartum Care for People with HIV) and to inform decisions about optimal management for the newborn (see Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection) (AIII).</td>
</tr>
<tr>
<td><strong>•</strong> CD4 T lymphocyte (CD4) cell count should be measured at the initial antenatal visit (AI). Patients who have been on ART for ≥2 years and who have had consistent viral suppression and CD4 counts that are consistently &gt;300 cells/mm³ do not need to have their CD4 counts monitored after the initial antenatal visit during this pregnancy, per the Adult and Adolescent Antiretroviral Guidelines (CIII). Patients who have been on ART for &lt;2 years, patients with CD4 counts &lt;300 cells/mm³, and patients with inconsistent adherence and/or detectable viral loads should have CD4 counts monitored every 3 months during pregnancy (CIII).</td>
</tr>
</tbody>
</table>
| **•** HIV drug-resistance testing (genotypic testing and, if indicated, phenotypic testing) should be performed during pregnancy in those whose HIV RNA levels are above the threshold for resistance testing (i.e., >500 copies/mL to 1,000 copies/mL) before—
  | o Initiating ART in antiretroviral (ARV)-naive pregnant people who have not been previously tested for ARV drug resistance (AII);  |
  | o Initiating ART in ARV-experienced pregnant people (including those who have received pre-exposure prophylaxis) (AIII); or  |
  | o Modifying ARV regimens for people with HIV who become pregnant while receiving ARV drugs or people who have suboptimal virologic response to ARV drugs that were started during pregnancy (AII). See Antiretroviral Drug Resistance and Drug Resistance Testing in Pregnancy.  |
| **•** ART should be initiated in pregnant patients prior to receiving the results of ARV-resistance tests. ART should be modified, if necessary, based on the results of resistance testing (AII). |
| **•** Laboratory testing to monitor complications of ARV drugs during pregnancy should be based on what is known about the adverse effects of the drugs an individual is receiving (AIII). |
| **•** Pregnant people with HIV who are taking ART during pregnancy should undergo standard glucose screening (AIII). Some experts suggest performing glucose screening early in pregnancy for those who are receiving protease inhibitor (PI)-based regimens that were initiated before pregnancy, in accordance with recommendations for patients who are at risk for glucose intolerance (BIII). For more information on PIs, see Antiretroviral Drug Regimens and Maternal and Neonatal Outcomes. |
| **•** Amniocentesis, if clinically indicated, should be performed on pregnant people with HIV only after initiation of an effective ARV regimen and, ideally, when HIV RNA levels are undetectable (BIII). If a pregnant person with detectable HIV RNA levels requires amniocentesis, consultation with an expert in the management of HIV during pregnancy should be considered (BIII). |

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
# Antiretroviral Drug Resistance and Resistance Testing in Pregnancy

(Updated December 30, 2021; last reviewed December 30, 2021)

<table>
<thead>
<tr>
<th>Panel's Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• HIV drug-resistance testing (genotypic and, if indicated, phenotypic) should be performed in persons with HIV whose HIV RNA levels are above the threshold for resistance testing (i.e., &gt;500 to 1,000 copies/mL) before—</td>
</tr>
<tr>
<td>o Initiating antiretroviral therapy (ART) in antiretroviral (ARV)-naive pregnant persons who have not been previously tested for ARV resistance (AII),</td>
</tr>
<tr>
<td>o Initiating ART in ARV-experienced pregnant persons (including those who have received pre-exposure prophylaxis) (AIII), or</td>
</tr>
<tr>
<td>o Modifying ARV regimens for those who are newly pregnant and receiving ARV drugs or who have suboptimal virologic response to the ARV drugs started during pregnancy (AII).</td>
</tr>
<tr>
<td>• Phenotypic resistance testing is indicated for treatment-experienced persons on failing regimens who are thought to have multidrug resistance (BIII).</td>
</tr>
<tr>
<td>• ART should be initiated in pregnant persons before receiving results of ARV-resistance testing; ART should be modified, if necessary, based on the results of resistance assays (AII).</td>
</tr>
<tr>
<td>• If the use of an integrase strand transfer inhibitor (INSTI) is being considered and INSTI resistance is a concern, providers should supplement standard resistance testing with a specific INSTI genotypic resistance assay (AIII). INSTI resistance may be a concern if—</td>
</tr>
<tr>
<td>o A patient received prior treatment that included an INSTI, or</td>
</tr>
<tr>
<td>o A patient has had a sexual partner on INSTI therapy who was not virologically suppressed or with unknown viral load.</td>
</tr>
<tr>
<td>o Documented zidovudine (ZDV) resistance does not affect the indications for use of intrapartum intravenous ZDV (see Intrapartum Care for People with HIV) (BIII).</td>
</tr>
<tr>
<td>• Choice of ARV regimen for an infant born to a person with known or suspected drug resistance should be determined in consultation with a pediatric HIV specialist, preferably before delivery (see Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection) (AIII).</td>
</tr>
<tr>
<td>• Pregnant persons with HIV should be given ART to maximally suppress viral replication, which is the most effective strategy for preventing development of resistance and minimizing risk of perinatal transmission (AII).</td>
</tr>
<tr>
<td>• All pregnant and postpartum individuals should be counseled about the importance of adherence to prescribed ARV medications to reduce the risk of developing resistance (AII).</td>
</tr>
</tbody>
</table>

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Pregnant People Who Have Not Achieved Viral Suppression on Antiretroviral Therapy

(Adopted January 14, 2015; last updated December 30, 2021; last reviewed December 30, 2021)

<table>
<thead>
<tr>
<th>Panel’s Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Because a pregnant person’s antenatal viral load correlates with the risk of perinatal transmission of HIV, suppression of HIV RNA to undetectable levels should be achieved as rapidly as possible (AII).</td>
</tr>
<tr>
<td>• For pregnant people who have not achieved viral suppression (after an adequate period of treatment):</td>
</tr>
<tr>
<td>o Assess medication adherence, tolerability, dosing, potential problems with drug absorption, adherence to food requirements, and possible drug interactions. (see Adherence to the Continuum of Care in the Adult and Adolescent Guidelines.)</td>
</tr>
<tr>
<td>o Perform HIV drug resistance testing if HIV RNA level is above the threshold for resistance testing (&gt;500 to 1,000 copies/mL (AII).</td>
</tr>
<tr>
<td>o Consult an HIV treatment expert and consider possible antiretroviral regimen modification (AIII).</td>
</tr>
<tr>
<td>• Please see Intrapartum Care for People with HIV for guidance about use of intrapartum intravenous zidovudine prophylaxis and scheduled cesarean delivery for pregnant people who have not achieved viral suppression on antiretroviral therapy (AII).</td>
</tr>
</tbody>
</table>

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
### Panel’s Recommendations

- All pregnant people with HIV should be screened during each pregnancy for hepatitis B virus (HBV) infection, unless they are already known to have HBV/HIV coinfection or have serologic documentation of HBV immunity.
- All pregnant people with HIV who screen negative for HBV infection and lack HBV immunity (i.e., HBV surface antigen negative, HBV core antibody negative, and HBV surface antibody negative) should promptly receive the HBV vaccine series *(AII)*.
- All pregnant people with chronic HBV infection who have not already received the hepatitis A virus (HAV) vaccine series should be screened for immunity to HAV. If they screen negative for HAV antibodies (either IgG or total antibody [IgG and IgM]), they should receive the HAV vaccine series *(AIII)*.
- After delivery, people with HBV/HIV coinfection should continue antiretroviral regimens that include drugs with anti-HBV activity: tenofovir disoproxil fumarate or tenofovir alafenamide plus lamivudine or emtricitabine *(AII)*.
- Pregnant people with HBV/HIV coinfection who are receiving antiretroviral therapy (ART) should be counseled about signs and symptoms of liver toxicity, and liver transaminases should be assessed 1 month after initiating ART and at least every 3 months thereafter during pregnancy *(BIII)*.
- For pregnant people with HBV/HIV coinfection who discontinue medications with anti-HBV activity, frequent monitoring of liver function tests for potential exacerbation of HBV infection is recommended, with prompt re-initiation of treatment for HBV when a flare is suspected *(BIII)*.
- HBV/HIV coinfection is not an independent indication for cesarean delivery (see *Intrapartum Care for People with HIV* *(AIII)*).
- Within 12 hours of birth, infants born to people with HBV should receive hepatitis B immune globulin and the first dose of the HBV vaccine series *(AI)*.

### Rating of Recommendations

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

*Rating of Evidence*: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
### Special Populations: Hepatitis C Virus/HIV Coinfection

(Last updated December 30, 2021; last reviewed December 30, 2021)

<table>
<thead>
<tr>
<th>Panel’s Recommendations</th>
</tr>
</thead>
</table>
| • All pregnant people with HIV should be screened during the current pregnancy for hepatitis C virus (HCV) infection (AIII).  
  o HCV screening should be repeated later in pregnancy in persons who initially screen negative for HCV but who have persistent or new risk factors for HCV (e.g., new or ongoing injection or intranasal substance use) (AIII).  
• All pregnant people with HIV also should be tested for hepatitis B virus (HBV) infection (see [Hepatitis B Virus/HIV Coinfection](#)(AIII)).  
• Pregnant people with HCV infection who have not already received the hepatitis A virus (HAV) vaccine series should be screened for immunity to HAV (AIII). If they screen negative for HAV antibodies (either immunoglobulin G [IgG] or total antibody [IgG and immunoglobulin M]), they should receive the HAV vaccine series (AIII).  
• Currently, treatment of HCV during pregnancy is not recommended (unless part of an approved experimental protocol) because of the lack of safety data on the use of HCV direct-acting antiviral agents in persons who are pregnant. If considering initiating HCV treatment in a pregnant person with HCV/HIV coinfection, consultation with an expert in HIV and HCV is strongly recommended (AIII).  
• Recommendations for antiretroviral therapy (ART) during pregnancy are the same for all people with HIV, including those who have HCV coinfection (AIII).  
• Pregnant people with HCV/HIV coinfection who are receiving ART should be counseled about the signs and symptoms of liver toxicity, and hepatic transaminases should be assessed 1 month following initiation of ART and at least every 3 months thereafter during pregnancy (BIII).  
• People with HCV should be strongly considered for HCV treatment with direct-acting antiviral agents postpartum (A1).  
• In people with HCV infection, HCV RNA should be evaluated after delivery to assess for spontaneous clearance of HCV infection, particularly as they are being considered for initiation of HCV therapy postpartum (BII).  
| **HCV/HIV coinfection is not an independent indication for cesarean delivery** (see [Intrapartum Care for People with HIV](#)(AIII)).  
• Infants born to people with HCV/HIV coinfection should be evaluated for HCV infection (AIII). Decisions regarding the specific type of assays to use for HCV screening in children and the timing of those assays should be made after consultation with an expert in pediatric HCV infection (AIII).  

**Rating of Recommendations:** A = Strong; B = Moderate; C = Optional  
**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
### Perinatal HIV Prevention for Transgender and Gender Diverse People Assigned Female Sex at Birth

(Last updated December 30, 2021; last reviewed December 30, 2021)

<table>
<thead>
<tr>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission has determined that, in most cases, it is appropriate to extrapolate its recommendations based on data in presumed cisgender women to all people assigned female sex at birth, including transgender and gender diverse people, with modification when indicated (e.g., drug interactions with gender-affirming hormones) (AIII).</td>
</tr>
<tr>
<td>• Patient-centered HIV and perinatal services should be provided using gender-affirming approaches and models of care that address the unique and varied needs of transgender and gender diverse people and reduce barriers to ongoing engagement in care that can affect adherence to antiretroviral therapy and the likelihood of viral suppression during prepregnancy, antepartum, and postpartum periods (AII).</td>
</tr>
<tr>
<td>o Patients should be asked about the pronouns they use and language preferences, including how they want to be referred to as a parent (e.g., the baby’s mother, father, or by another name) and terms they prefer to use for sexual and reproductive anatomy and examinations (e.g., breast exams, pelvic exams) (AIII).</td>
</tr>
<tr>
<td>• Health care providers should assess reproductive and parenting intentions and support access to appropriate contraception and perinatal HIV prevention services for transgender and gender diverse people (AIII).</td>
</tr>
<tr>
<td>• Prepregnancy care for transgender and gender diverse people should incorporate shared decision-making that addresses needs related to gender identity, with consideration of the potential risks and benefits of gender-affirming pharmacologic treatment in relation to pregnancy (AIII).</td>
</tr>
<tr>
<td>• Some transgender and gender diverse patients may experience the onset or worsening of gender dysphoria and associated symptoms—such as depression—during prepregnancy, antepartum, and postpartum periods; health care providers should regularly assess patients’ comfort with their care and provide referrals for mental health or other support services as needed (AIII).</td>
</tr>
</tbody>
</table>

For additional information, see Transgender People with HIV in the Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents Living with HIV.

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
# HIV-2 Infection and Pregnancy

(Last updated December 30, 2021; last reviewed December 30, 2021)

## Panel’s Recommendations

- HIV-2 infection should be considered in pregnant people who are from—or who have partners who are from—countries in which the virus is endemic and who have positive results on an HIV-1/HIV-2 antibody or HIV-1/HIV-2 antigen/antibody immunoassay. They should be tested with a supplemental HIV-1/HIV-2 antibody differentiation assay. If they have only HIV-2 infection, the test will be negative for HIV-1 antibodies and positive for HIV-2 antibodies (AII).

- Pregnant people with HIV-2 infection should be treated based on the guidelines for HIV-1 mono-infection, but using antiretroviral (ARV) drugs that are active against HIV-2. Non-nucleoside reverse transcriptase inhibitors and enfuvirtide are not active against HIV-2 and **should not be used** (AIII).

- No randomized clinical trials have been performed to address when to start treatment or what the optimal treatment is for HIV-2 infection (AIII). A regimen with two nucleoside reverse transcriptase inhibitors (NRTIs) and integrase strand transfer inhibitors or certain boosted protease inhibitors is recommended for all pregnant people with HIV-2 infection (AIII).

- Dolutegravir, raltegravir, darunavir/ritonavir, or lopinavir/ritonavir plus a dual-NRTI backbone of abacavir plus lamivudine (3TC), or tenofovir disoproxil fumarate or tenofovir alafenamide plus emtricitabine or 3TC are recommended for treating HIV-2 mono-infection in pregnant people and in people who are trying to conceive (AIII). Zidovudine (ZDV) plus 3TC can be used as an alternative dual-NRTI backbone. See **Recommendations for Use of Antiretroviral Drugs During Pregnancy** and **Appendix C: Antiretroviral Counseling Guide for Health Care Providers**.

- As with HIV-1, the possibility of hepatitis B virus/HIV-2 coinfection should be considered when choosing an ARV regimen to treat HIV-2 (AI) (see **Hepatitis B Virus/HIV Coinfection**).

- All infants born to people with HIV-2 infection (without HIV-1 infection) should receive the 4-week ZDV prophylactic regimen (BIII) (see **Table 8** and **Table 9**).

- In the United States, where safe infant formula is readily available, breastfeeding **is not recommended** for infants born to people with HIV-2 infection (AIII).

---

**Rating of Recommendations:** A = Strong; B = Moderate; C = Optional  
**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
### Panel's Recommendations

- The management of prenatal care and general principles of antiretroviral therapy (ART) and HIV management do not differ between pregnant people with perinatally-acquired HIV (PHIV) and those with non-perinatally acquired HIV (AII).
- Using the same guiding principles that are used for heavily ART-experienced adults, optimal ARV regimens should be selected based on resistance testing, ART treatment history, and pill burden (AII).
- Consultation with experts in HIV and pregnancy is recommended when the presence of extensive drug resistance warrants the use of antiretroviral drugs for which there is limited experience in pregnancy (AIII).
- Pregnant people with PHIV warrant enhanced focus on adherence interventions during pregnancy and after delivery (AII).

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
### Panel's Recommendations

- **When acute HIV infection is suspected in pregnancy or during breastfeeding,** a plasma HIV RNA test should be obtained in conjunction with an antigen/antibody immunoassay test (AII). See [Acute and Recent (Early) HIV Infection](#) in the Adult and Adolescent Antiretroviral Guidelines and the Centers for Disease Control and Prevention HIV testing algorithm for more information.

- **Repeat HIV testing in the third trimester is recommended** for pregnant people with initial negative HIV test results 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 women per year, who reside in jurisdictions with elevated HIV incidence (see [Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings](#)), or those who reside in states that require third-trimester testing (see [Maternal HIV Testing and Identification of Perinatal HIV Exposure](#)) (AII).

- **All pregnant and breastfeeding people with acute or recent HIV infection** should start antiretroviral therapy (ART) as soon as possible to reduce the risk of vertical HIV transmission, with the goal of rapidly suppressing plasma HIV RNA below detectable levels (AII).

- In people with acute HIV infection, baseline genotypic resistance testing should be performed simultaneously with initiation of ART, and the regimen should be adjusted, if necessary, to optimize virologic response (AII).

- **Dolutegravir (DTG) plus tenofovir disoproxil fumarate (TDF) or tenofovir alafenamide (TAF) with emtricitabine (FTC) or lamivudine (3TC)** is the Preferred ART regimen for pregnant people with acute HIV, irrespective of trimester (see Table 4, Table 5, [Recommendations for Use of Antiretroviral Drugs During Pregnancy](#), and Appendix C: Antiretroviral Counseling Guide for Health Care Providers) (AII).

- **Ritonavir boosted darunavir (DRV/r) plus TDF or TAF with FTC or 3TC** is an Alternative ART regimen for pregnant people with acute HIV (AIII). See Table 4, Table 5, and [Recommendations for Use of Antiretroviral Drugs During Pregnancy](#) for more information.

- One of the following regimens is recommended for people diagnosed with acute HIV infection when they are breastfeeding: bictegravir (BIC)/TAF/FTC; DTG with TAF or TDF plus FTC or 3TC; or boosted darunavir (DRV) with TAF or TDF plus FTC or 3TC (AIII). See [Acute and Recent (Early) HIV Infection](#) in the Adult and Adolescent Antiretroviral Guidelines for more information.

- **People who receive a diagnosis of acute HIV infection when they are breastfeeding should be counseled to discontinue breastfeeding immediately to reduce the risk of postnatal HIV transmission to the infant** (AII).

- The Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission emphasizes the importance of counseling and informed decision-making regarding all antiretroviral (ARV) regimens for people with HIV (AIII).

- Providers should inform individuals starting ART of the importance of strict adherence to rapidly achieve and maintain viral suppression (AIII).

- Infants born to people who received a diagnosis of acute HIV infection during pregnancy or breastfeeding are at high risk of acquiring HIV infection and should receive an ARV regimen that is appropriate for this elevated risk (see Table 8 in [Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection](#)) (AII). Consulting a pediatric HIV specialist regarding appropriate infant management is strongly recommended (see [Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection](#)).

### Rating of Recommendations

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

- **Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
**Intrapartum Care for People with HIV**

(Last updated December 30, 2021; last reviewed December 30, 2021)

### Panel's Recommendations

#### HIV Testing for Pregnant People with Unknown HIV Status in Labor
- Pregnant people who present in labor with unknown HIV status and people with increased risk of HIV infection who were not retested in the third trimester should undergo expedited antigen/antibody HIV testing (AII). See Maternal HIV Testing and Identification of Perinatal HIV Exposure for more information.
  - If results are positive, an HIV-1/HIV-2 antibody differentiation test and an HIV-1 RNA assay should be done as soon as possible, and intravenous (IV) zidovudine (ZDV) should be initiated pending the result of the differentiation test (AII).
  - If acute HIV infection is suspected or if a person has had recent HIV exposure, an HIV RNA assay also should be done at the time of expedited antigen/antibody testing (AII). See Acute HIV Infection.

#### Intrapartum Antiretroviral Therapy (ART), ZDV Prophylaxis, and Mode of Delivery for Pregnant People with HIV
- See Table 7 Intrapartum Care and Recommended Interventions to Prevent Perinatal HIV Transmission for Pregnant People with HIV Based on HIV RNA Levels at the Time of Delivery below.
- Patients should continue taking their antepartum ART on schedule during labor and before scheduled cesarean delivery (AIII).
- For individuals with HIV RNA >1,000 copies/mL or unknown HIV RNA near the time of delivery (within 4 weeks of delivery)
  - Intrapartum IV ZDV should be administered in the following situations based on laboratory and clinical information near the time of delivery: (a) HIV RNA >1,000 copies/mL, (b) unknown HIV RNA, (c) known or suspected lack of adherence since the last HIV RNA result, or (d) a positive expedited antigen/antibody HIV test result during labor (AII). Begin IV ZDV when patients present in labor or at least 3 hours prior to scheduled cesarean delivery (AII).
  - When HIV RNA is >1,000 copies/mL or is unknown near the time of delivery, scheduled cesarean delivery at 38 weeks gestation is recommended to minimize perinatal HIV transmission, irrespective of administration of antepartum ART (AII).
  - Management of patients originally scheduled for cesarean delivery because of HIV RNA >1,000 copies/mL who present in labor or with ruptured membranes must be individualized at the time of presentation (BII). In these circumstances, evidence is insufficient to determine whether cesarean delivery reduces the risk of perinatal HIV transmission. Consultation with an expert in perinatal HIV (e.g., telephone consultation with the National Perinatal HIV/AIDS Clinical Consultation Center at 1-888-448-8765) may be helpful in rapidly developing an individualized delivery plan.
- For individuals receiving ART with HIV RNA ≤1,000 copies/mL near the time of delivery (within 4 weeks of delivery)
  - IV ZDV is not required for people who meet ALL of the following three criteria: (1) are receiving ART, (2) have HIV RNA <50 copies/mL within 4 weeks of delivery, and (3) are adherent to their ARV regimen (BII).
  - IV ZDV may be considered for people with HIV RNA ≥50 copies/mL and ≤1,000 copies/mL within 4 weeks of delivery (BII). Data are insufficient to determine whether administration of IV ZDV to people with HIV RNA levels between 50 copies/mL and 1,000 copies/mL provides any additional protection against perinatal HIV transmission. This decision can be made on a case-by-case basis, taking into consideration their recent ART adherence and preferences and involving expert consultation if needed (CII).
  - Scheduled cesarean delivery performed solely for prevention of perinatal HIV transmission in those receiving ART with HIV RNA ≤1,000 copies/mL near the time of delivery is not recommended given the low rate of perinatal transmission in this group (AII).
  - In pregnant people with HIV RNA levels ≤1,000 copies/mL, if scheduled cesarean delivery or induction of labor is indicated for non-HIV-related reasons, it should be performed at the standard time for obstetric indications (AII). Labor should not be induced to prevent perinatal HIV transmission.
  - In pregnant people on ART with HIV RNA ≤1,000 copies/mL, duration of ruptured membranes is not associated with an increased risk of perinatal transmission and is not an indication for cesarean delivery to prevent HIV transmission (BII).
### Other Intrapartum Management Considerations (see Table 7 below)

- Fetal scalp electrodes for fetal monitoring should be avoided, particularly when maternal HIV RNA is not suppressed (≥50 copies/mL) or is unknown, because of the potential risk of HIV transmission (BIII). See Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection.

- Artificial rupture of membranes and operative vaginal delivery with forceps or a vacuum extractor should follow standard obstetric indications but should be avoided if possible in those with HIV RNA ≥50 copies/mL (BIII).

- The ARV regimen a patient is receiving should be taken into consideration when using methergine to treat excessive postpartum bleeding caused by uterine atony.
  - In patients who are receiving a cytochrome P450 (CYP) 3A4 enzyme inhibitor (e.g., a protease inhibitor or cobicistat), methergine should be used only if no alternative treatments for postpartum hemorrhage are available and the need for pharmacologic treatment outweighs the risks. If methergine is used, it should be administered at the lowest effective dose for the shortest possible duration (BIII).
  - In patients who are receiving a CYP3A4 enzyme inducer—such as nevirapine, efavirenz, or etravirine—additional uterotonic agents may be needed because of the potential for decreased methergine levels and inadequate treatment effect (BIII).

### Rating of Recommendations:

- **A** = Strong; **B** = Moderate; **C** = Optional

### Rating of Evidence:

- **I** = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; **II** = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; **III** = Expert opinion
Panel's Recommendations

- Antiretroviral therapy (ART) is currently recommended for all individuals with HIV to reduce the risk of disease progression and to prevent the sexual transmission of HIV (AⅠ).
- ART should be continued after delivery (AⅠ). Any plans for modifying ART after delivery should be made in consultation with the individual and their HIV care provider, ideally before delivery, taking into consideration the recommended regimens for nonpregnant adults (AⅢ) and plans for future pregnancies.
- Because the immediate postpartum period poses unique challenges to ART adherence, arrangements for new or continued supportive services should be made before hospital discharge (AⅡ).
- People with a positive expedited HIV antibody test during labor should receive confirmatory testing. If testing confirms HIV infection, ART should be offered, and they should be given a supply of ART before hospital discharge to prevent treatment interruption (AⅡ). Immediate linkage to HIV care and comprehensive follow-up also is needed (AⅡ).
- Infants of people who have HIV newly diagnosed in the intrapartum period should begin presumptive HIV therapy and a supply of ART for their infants should be provided before hospital discharge (AⅡ) (see Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection).
- Breastfeeding is not recommended for people in the United States who have confirmed HIV or are presumed to have HIV as long as safer infant feeding alternatives are available (AⅠ). People who desire to breastfeed should receive evidence-based counseling on infant feeding options (AⅢ) (see Counseling and Managing Individuals with HIV in the United States Who Desire to Breastfeed).
- Infant feeding counseling—including a discussion of potential barriers to formula feeding—should begin during the prenatal period; this information should be reviewed after delivery (AⅢ).
- Clinicians should discuss future reproductive plans and timing, as well as the risks and benefits of conceiving while on specific antiretroviral (ARV) medications and the use of appropriate contraceptive options to prevent unintended pregnancy (AⅡ).
- Contraceptive counseling should involve shared decision-making and should start during the prenatal period; a contraceptive plan should be developed before hospital discharge, as desired by the patient (AⅡ).

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

**Rating of Evidence**: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Panel’s Recommendations

- In the United States, infant formula feeding is a safe alternative to breastfeeding in individuals with HIV. Breastfeeding presents an ongoing risk of HIV exposure after birth, because suppressive maternal antiretroviral therapy significantly reduces but does not eliminate the risk of HIV transmission through breastfeeding. Therefore, breastfeeding is not recommended for individuals with HIV in the United States (AII).

- Individuals who have questions about breastfeeding or who desire to breastfeed should receive patient-centered, evidence-based counseling on infant feeding options (AIII).

- Individuals with HIV who choose to breastfeed should be supported in risk-reduction measures to minimize the risk of HIV transmission to their infants (BIII).

- Clinicians are encouraged to consult the National Perinatal HIV Hotline (1-888-448-8765) if they have questions regarding individuals with HIV who desire to breastfeed (AIII).

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

Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
## Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection

(Last updated December 30, 2021; last reviewed December 30, 2021)

### Panel's Recommendations

- All newborns who were exposed perinatally to HIV should receive postpartum antiretroviral (ARV) drugs to reduce the risk of perinatal transmission of HIV (AI).
- Newborn ARV regimens administered at doses that are appropriate for the infant's gestational age should be initiated as close to the time of birth as possible, preferably within 6 hours of delivery (AII).
- A newborn's ARV regimen should be determined based on maternal and infant factors that influence the risk of perinatal transmission of HIV (AII). The uses of ARV regimens in newborns include the following:
  - **ARV Prophylaxis**: The administration of one or more ARV drugs to a newborn without documented HIV infection to reduce the risk of perinatal acquisition of HIV.
  - **Presumptive HIV Therapy**: The administration of a three-drug ARV regimen to newborns who are at highest risk of perinatal acquisition of HIV. Presumptive HIV therapy is intended to be preliminary treatment for a newborn who is later documented to have HIV, but it also serves as prophylaxis against HIV acquisition for those newborns who are exposed to HIV in utero, during the birthing process, or during breastfeeding and who do not acquire HIV.
  - **HIV Therapy**: The administration of a three-drug ARV regimen at treatment doses (called antiretroviral therapy [ART]) to newborns with documented HIV infection (see Diagnosis of HIV Infection in Infants and Children).
- A 4-week zidovudine (ZDV) ARV prophylaxis regimen can be used in newborns whose mothers received ART during pregnancy and had viral suppression within 4 weeks prior to delivery (defined as a confirmed HIV RNA level <50 copies/mL) and for whom maternal adherence is not of concern (BII).
- Newborns at high risk of perinatal acquisition of HIV should begin presumptive HIV therapy (see Table 9 for recommended regimens). Newborns at high risk of HIV acquisition include those born to people with HIV who—
  - Have not received antepartum ARV drugs (AI), or
  - Have received only intrapartum ARV drugs (AI), or
  - Have received antepartum ARV drugs but who did not achieve viral suppression (defined as a confirmed HIV RNA level <50 copies/mL) within 4 weeks of delivery (AII), or
  - Have primary or acute HIV infection during pregnancy (AII).
- Presumptive HIV therapy should be administered to infants of mothers who have primary or acute HIV infection while breastfeeding (AII).
- If a patient presents with unknown HIV status and has a positive expedited HIV test during labor or shortly after delivery, the infant should begin presumptive HIV therapy (AII). If supplemental maternal testing is negative, the infant's ARV regimen should be discontinued (AII).
- For newborns with HIV infection, ART should be initiated (AI).
- The use of ARV drugs other than ZDV, lamivudine, and nevirapine cannot be recommended for any indication in premature newborns (<37 weeks gestational age) because of the lack of dosing and safety data (BII).
- Providers with questions about ARV management of perinatal HIV exposure should consult the National Perinatal HIV Hotline (1-888-448-8765), which provides free clinical consultation on all aspects of perinatal HIV, including newborn care (AIII).

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

### Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Panel’s Recommendations

- Virologic assays (i.e., HIV RNA or HIV DNA nucleic acid tests [NATs]) that directly detect HIV must be used to diagnose HIV in infants and children aged <18 months with perinatal and postnatal HIV exposure; HIV antibody and HIV antigen/antibody tests should not be used (AII).

- Plasma HIV RNA or cell-associated HIV DNA NATs are generally equally recommended (AII). However, the results of plasma HIV RNA NAT or plasma HIV RNA/DNA NAT can be affected by antiretroviral therapy (ART), or by antiretroviral (ARV) drugs administered to the infant as prophylaxis or presumptive HIV therapy.

- An assay that detects HIV non-B subtype viruses or Group O infections (e.g., an HIV RNA NAT or a dual-target total DNA/RNA test) is recommended for use in infants and children who were born to mothers with known or suspected non-B subtype virus or Group O infections (AII). If a mother of an infant acquired HIV outside of the United States and has had repeated undetectable HIV RNA by standard testing, consultation with a clinical virologist on more sensitive HIV nucleic acid testing may be indicated.

- Virologic diagnostic testing (see Table 10 below) is recommended for all infants with perinatal HIV exposure at the following ages:
  - 14 to 21 days (AII)
  - 1 to 2 months (AII)
  - 4 to 6 months (AII)

- For infants who are at high risk of perinatal HIV infection, virologic diagnostic testing is recommended at birth (AII) and at 2 to 6 weeks after ARV drugs are discontinued (BII).

- A positive virologic test should be confirmed as soon as possible by a repeat virologic test (AII).

- Definitive exclusion of HIV infection in non-breastfed infants is based on two or more negative virologic tests conducted after infants have completed ARV prophylaxis or presumptive HIV therapy, with one negative test obtained at age ≥1 month and one at age ≥4 months, or two negative HIV antibody tests from separate specimens that were obtained at age ≥6 months (AII).

- No additional HIV testing of any kind (e.g., HIV RNA or HIV DNA NAT, HIV antibody, HIV antigen/antibody) is needed routinely for non-breastfed infants who meet the criteria for definitive exclusion of HIV and who have had no known or suspected HIV exposure after birth.

- Infants with potential HIV exposure after birth (e.g., from breastfeeding, premasticated feeding, sexual abuse, contaminated blood products, percutaneous exposure) who are aged <18 months require additional testing using HIV RNA/DNA NAT assays to establish their HIV status. Infants aged ≥18 months who have these potential exposures require HIV antigen/antibody testing.

- Age-appropriate HIV testing also is recommended for infants and children with signs and/or symptoms of HIV, even in the absence of documented or suspected HIV exposure.

- HIV antibody (or HIV antigen/antibody) tests are recommended for diagnostic testing in children with non-perinatal exposure only or in children with perinatal exposure aged >24 months (AII).

- When acute HIV infection is suspected, additional testing with an HIV NAT may be necessary to diagnose HIV infection (AII).

Note: The National Clinician Consultation Center provides consultations on issues related to the management of perinatal HIV infection (1-888-448-8765; 24 hours a day, 7 days a week).

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/adolescents, but not studies limited to post-pubertal adolescents.
Panel’s Recommendations

- All newborns who were perinatally exposed to HIV should receive appropriate antiretroviral (ARV) drugs as soon as possible, preferably within 6 hours, after delivery (see Antiretroviral Management of Newborns with Perinatal HIV Exposure or Perinatal HIV (AI)).

- A complete blood count and differential should be performed on newborns as a baseline evaluation (BIII).

- Infants who are found to have hematologic abnormalities may need to discontinue ARV drugs. Clinicians should base the decision to discontinue ARV drugs on the individual needs of the patient. Consultation with an expert in pediatric HIV infection is advised if early discontinuation of ARV drugs is considered (CIII).

- When determining the timing for subsequent monitoring of hematologic parameters in infants, clinicians need to consider the infant’s baseline hematologic values, gestational age at birth, and clinical condition; whether the infant is receiving zidovudine (ZDV), other ARV drugs, or certain concomitant medications; and the specific ARV drugs used in the mother’s antepartum drug regimen (CIII).

- Hemoglobin and neutrophil counts should be remeasured 4 weeks after initiating an ARV regimen that contains ZDV and lamivudine (AI).

- Virologic tests are required to diagnose HIV infection in infants aged <18 months (see Diagnosis of HIV Infection in Infants and Children (AII)).

- To prevent Pneumocystis jirovecii pneumonia (PCP), all infants born to mothers with HIV should begin PCP prophylaxis at age 4 to 6 weeks, after completing their ARV prophylaxis or an empiric HIV therapy regimen, unless there is adequate test information to presumptively exclude HIV infection (see the Pediatric Opportunistic Infections Guidelines (AII)).

- Health care providers should inquire routinely about infant feeding plans and/or breastfeeding desires, as well as the use of pre-masticated (pre-chewed or pre-warmed) food. Counseling against pre-mastication and discussion of safe infant feeding options should be provided (see Counseling and Managing Individuals with HIV in the United States Who Desire to Breastfeed) (AIII).

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

Rating of Evidence: I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion
Long-Term Follow-Up of Infants Exposed to Antiretroviral Drugs

(Last updated December 30, 2021; last reviewed December 30, 2021)

<table>
<thead>
<tr>
<th>Panel's Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Children with <em>in utero</em> or neonatal exposure to antiretroviral (ARV) drugs who develop significant organ system abnormalities of unknown etiology, particularly of the nervous system or heart, should be evaluated for potential metabolic dysfunction (<em>CIII</em>).</td>
</tr>
<tr>
<td>• It is important that the long-term medical record of a child without HIV includes information about <em>in utero</em> and neonatal ARV exposure (<em>BIII</em>).</td>
</tr>
</tbody>
</table>

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

**Rating of Evidence:** I = One or more randomized trials with clinical outcomes and/or validated laboratory endpoints; II = One or more well-designed, nonrandomized trials or observational cohort studies with long-term clinical outcomes; III = Expert opinion