

Initial Postnatal Management of the Neonate Exposed to HIV

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Panel's Recommendations
<ul style="list-style-type: none"> All newborns perinatally exposed to HIV should receive appropriate antiretroviral (ARV) drugs as soon as possible, preferably within 6 hours after birth (see Antiretroviral Management of Infants With <i>In Utero</i>, Intrapartum, or Breastfeeding Exposure to HIV) (AI). Longitudinal laboratory monitoring for adverse events is not needed in otherwise healthy infants receiving currently recommended ARV drugs for prophylaxis in the first 6 weeks of life (see Safety of Antiretroviral Drugs Used for Infant Prophylaxis in Antiretroviral Management of Infants with <i>In Utero</i>, Intrapartum, or Breastfeeding Exposure to HIV) (AII). Nucleic acid tests (e.g., DNA and RNA polymerase chain reaction [PCR] assays) are required for diagnosing HIV infection in infants aged <18 months (see Diagnosis of HIV Infection in Infants and Children) (AII). To prevent <i>Pneumocystis jirovecii</i> pneumonia (PJP), all infants perinatally exposed to HIV should begin PJP prophylaxis at age 4 to 6 weeks, unless adequate test information is available to presumptively exclude HIV infection (see Pneumocystis jirovecii Pneumonia in 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 premasticated food (prechewed or prewarmed in the mouth). Counseling against premastication and discussion of safe infant feeding options should be provided (see Preventing HIV Transmission During Infant Feeding) (AIII). Screening for congenital cytomegalovirus (cCMV) is recommended in the first 21 days of life using a PCR assay in urine and/or saliva (see Cytomegalovirus in the Pediatric Opportunistic Infection Guidelines) (CIII). In certain states, universal newborn screening for cCMV using dried blood spots is recommended. This test currently serves as an adjunct to urinary and salivary testing for cCMV pending further validation. Infants perinatally exposed to hepatitis B surface antigen (HBsAg) positive should be tested for HBsAg and should receive hepatitis B (HBV) immune globulin and the first dose of the HBV vaccine series as soon as possible, preferably within 12 hours after birth, followed by the routine HBV vaccine series. Post-vaccination serologic testing for HBV should be performed between 9 and 12 months of age (see Hepatitis B Virus/HIV Coinfection) (AI). Infants with perinatal exposure to hepatitis C virus (HCV) should receive an HCV RNA PCR assay at age 2 to 6 months (see Hepatitis C Virus/HIV Coinfection) (AIII).
<p>Rating of Recommendations: A = Strong; B = Moderate; C = Optional</p> <p>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</p>

Postnatal Management of the Neonate Exposed to HIV

Following birth, infants exposed to HIV should have a detailed physical examination, and a thorough maternal health history should be obtained. With pregnancies impacted by HIV, there may be coinfections with other pathogens that can be transmitted during pregnancy and the birthing process, such as cytomegalovirus (CMV), Zika virus, herpes simplex virus, hepatitis B virus (HBV), hepatitis C virus (HCV), syphilis, toxoplasmosis, and tuberculosis. Infants perinatally exposed to such

coinfections should undergo appropriate evaluation to exclude the possibility of transmission of additional infectious agents. The routine primary immunization schedule for children should be followed for infants perinatally exposed to HIV. One study examining humoral response to routine vaccination in infants who were exposed to HIV but uninfected (HEU) demonstrated robust antibody responses to vaccine antigens to support this recommendation.¹ However, the immunization schedule may need to be modified for infants with confirmed HIV infection (see the [Pediatric Opportunistic Infections Guidelines](#) for more information).

No evidence is available to enable the Panel on Treatment of HIV During Pregnancy and Prevention of Perinatal Transmission to assess whether any changes in routine bathing practices or timing of circumcision are indicated for newborns with perinatal HIV exposure.

Antiretroviral Prophylaxis and Presumptive HIV Therapy in Infants

All newborns exposed to HIV should receive appropriate antiretroviral (ARV) drugs as soon as possible, preferably within 6 hours after birth (see [Antiretroviral Management of Infants With In Utero, Intrapartum, or Breastfeeding Exposure to HIV](#)). Providers should instruct caregivers on how to measure and administer ARV drugs correctly, provide access to medications after discharge, explain the importance of adherence, and suggest strategies for avoiding missed doses (see [Adherence to Antiretroviral Therapy in Children and Adolescents With HIV](#)).

Based on existing safety data, longitudinal laboratory monitoring for adverse events is not needed in otherwise healthy infants receiving currently recommended ARV drugs used for prophylaxis unless administration occurs beyond 6 weeks of life. The American Academy of Pediatrics recommends periodic monitoring of hematologic and liver toxicity in breastfeeding infants receiving ARV prophylaxis with nevirapine (NVP) beyond this period and for extended durations.² See Safety of Antiretroviral Drugs Used for Infant Prophylaxis in [Antiretroviral Management of Infants With In Utero, Intrapartum, or Breastfeeding Exposure to HIV](#).

Hematologic Toxicity

Older studies have shown that anemia is the primary hematologic complication in neonates who received a 6-week postnatal prophylaxis regimen with zidovudine (ZDV).³ Combination ARV regimens are associated with an elevated risk of toxicity compared with single agents, but the three-drug regimens currently recommended for presumptive treatment (e.g., NVP/ZDV/lamivudine [3TC] or raltegravir [RAL]/ZDV/3TC) appear very safe when used for 6 or fewer weeks. For more information, see Combination ARV Regimens in [Antiretroviral Management of Infants With In Utero, Intrapartum, or Breastfeeding Exposure to HIV](#).

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. Considerations include the extent of the abnormality, whether related symptoms are present, the duration of ARV drugs received by the infant, and the risk of HIV infection (as assessed by maternal history of ARV drugs, viral load near birth, and mode of birth). A 2-week ZDV neonatal regimen **is recommended** in situations where there is a low risk of perinatal HIV transmission (see specific criteria in [Table 11. Antiretroviral Management for Infants With In Utero or Intrapartum Exposure to HIV](#) in [Antiretroviral Management of Infants With In Utero, Intrapartum, or Breastfeeding Exposure to HIV](#)).⁴ The shorter ZDV regimen may mitigate the risk of anemia in infants who are HEU.

Hyperbilirubinemia

The primary toxicity of concern with the use of RAL in the neonatal period has been the potential displacement of unconjugated bilirubin from albumin binding sites. However, at recommended dosing, RAL appears safe. RAL is metabolized by uridine diphosphate glucuronosyltransferase (UGT) 1A1, the same enzyme responsible for the elimination of bilirubin; UGT enzyme activity is low at birth, and RAL elimination is prolonged in neonates. In addition, RAL binds albumin, raising a theoretical concern that displacement of bilirubin could lead to hyperbilirubinemia. However, *in vitro* studies suggest RAL is safe at the drug exposures achieved for treatment.⁵ IMPAACT P1110, the single-arm regulatory Phase 1/2 trial that established dosing for RAL, evaluated safety in 52 infants of 34 weeks gestational age and older; no adverse events were attributed to RAL, and no bilirubin levels exceeded 16 mg/dL.⁶

Prophylaxis Against *Pneumocystis jirovecii* Pneumonia

To prevent *Pneumocystis jirovecii* pneumonia, all high-risk infants perinatally exposed to HIV should begin trimethoprim-sulfamethoxazole prophylaxis at age 4 to 6 weeks, unless adequate virologic test information exists to presumptively exclude HIV infection (see the [Pneumocystis jirovecii Pneumonia](#) section of the [Pediatric Opportunistic Infections Guidelines](#)).⁷ With appropriate follow-up to support the recommended diagnostic testing schedule, most infants with perinatal HIV exposure do not require trimethoprim-sulfamethoxazole prophylaxis because HIV can be presumptively excluded by the time their postnatal ARV regimen is completed (see [Diagnosis of HIV Infection in Infants and Children](#)).

Testing for Viral Coinfections in the Infant

The prevalence of congenital CMV (cCMV) is higher in infants with perinatal exposure to HIV than in the general population.⁸⁻¹³ Screening for cCMV is recommended in the first 21 days of life. Early diagnosis allows for appropriate monitoring and antiviral intervention with (val)ganciclovir, which improves clinical outcomes for associated comorbidities, including sensorineural hearing loss. The [Pediatric Opportunistic Infection Guidelines](#) recommend testing for cCMV in urine and/or saliva using a polymerase chain reaction assay, and a routine newborn audiologic evaluation. For infants diagnosed with cCMV, longitudinal audiologic follow-up and neurodevelopmental assessments are recommended (see [Cytomegalovirus](#)).¹⁴ In certain states, universal newborn screening for cCMV is recommended using dried blood spots. This test currently serves as an adjunct to urinary and salivary testing for CMV pending further validation.

HCV screening with an anti-HCV antibody test is recommended for all during each pregnancy.^{15,16} The Centers for Disease Control and Prevention (CDC) recommends HCV testing for all infants and children perinatally exposed to current or probable HCV infection. Infants with perinatal exposure to HCV should receive a nucleic acid test (NAT) for HCV RNA at age 2 to 6 months to identify children in whom chronic HCV infection might develop.¹⁷ Parents or caregivers should receive counseling about the need for testing and follow-up (see [Hepatitis C Virus/HIV Coinfection](#)). Infants with detectable HCV RNA should be managed in consultation with a health care provider who has expertise in pediatric HCV management. Infants with an undetectable HCV RNA result do not require further follow-up unless clinically warranted.¹⁸

It is recommended that HBV screening for hepatitis B surface antigen (HBsAg) occur for all during each pregnancy, preferably in the first trimester, regardless of vaccination status or history of testing (see [Hepatitis B Virus/HIV Coinfection](#)).¹⁹ The CDC recommends that infants perinatally exposed to HBsAg be tested for HBsAg. In the context of a positive maternal HBsAg screening, all infants including those with perinatal HIV exposure, should receive hepatitis B immune globulin and the first dose of the HBV vaccine series as soon as possible, preferably within 12 hours after birth, followed

by the routine HBV vaccine series. Post-vaccination serologic testing for HBV should be performed between 9 and 12 months of age (see Evaluating and Managing Infants Who Were Exposed to HIV in [Hepatitis B Virus/HIV Coinfection](#)). Infants with detectable HBV DNA should be managed in consultation with a health care provider with expertise in pediatric HBV management.

HIV Testing of the Infant

All infants who are perinatally exposed to HIV require diagnostic testing using NATs (e.g., HIV RNA or HIV DNA assays) to diagnose or exclude HIV infection. For a detailed discussion of HIV testing, including types of tests and the recommended HIV testing schedule, see [Table 13. Recommended Virologic Testing Schedules for Infants With Perinatal and Breastfeeding Exposure to HIV](#) in [Diagnosis of HIV Infection in Infants and Children](#).

Infant Feeding Practices and Risk of HIV Transmission

Evidence-based, patient-centered counseling should be provided to support shared decision-making about infant feeding prior to conception or as early as possible in pregnancy with HIV. Plans for infant feeding should be reviewed throughout pregnancy and again after birth. At postnatal visits, it is important to discuss infant feeding to assess feeding practices, identify barriers, and provide supports for the appropriate implementation of their chosen method (see [Preventing HIV Transmission During Infant Feeding](#)). For information on ARV prophylaxis duration and HIV screening frequency for breastfeeding infants, see [Antiretroviral Management of Infants With In Utero, Intrapartum, or Breastfeeding Exposure to HIV](#), [Pregnancy and Postpartum HIV Testing and Identification of Perinatal and Postnatal HIV Exposure](#), and [Diagnosis of HIV Infection in Infants and Children](#).

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