PUBLIC HEALTH IN THE 406

Perinatal Toolkit

Addressing syphilis, hepatitis B, hepatitis C, and HIV.

2024

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Hepatitis B
Immunization Program
406-444-1805
Perinatal Hepatitis and Hepatitis B Resources (mt.gov)

Hepatitis C
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Prevention: 406-444-3565
Surveillance/case investigation: 406-444-0273
Hepatitis C (mt.gov)

HIV
STD/HIV/HCV Program
Prevention: 406-444-3565
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Syphilis/Congenital Syphilis
STD/HIV/HCV Program
406-444-3565
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Introduction

During pregnancy, infections can be associated with devastating consequences to the pregnant mother and developing fetus. Infections can be transmitted from the mother to the fetus through vertical transmission. Vertical transmission is defined as an infection of the fetus from the maternal host.

Fetal development is a complex process that begins at conception and continues until the birth of the baby. During this process, each of the fetus's organs and body systems develop. During critical times of development, the developing fetus is very sensitive to exposures which include infections by bacteria, viruses, and parasites. Harmful exposures during pregnancy can increase the risk of miscarriage or pregnancy complications such as preterm delivery, organ injury or other sequelae depending on the pathogen. Most early preterm births are associated with intrauterine infection, which triggers an inflammatory response believed to result in preterm labor and injury to the developing fetal lung and brain.

Early prenatal care and testing for infections is a crucial part of preventing congenital infections. A health care system that is responsive to the needs of families and especially women, requires strategies to ensure access to services, identify risks early, and provide linkage to the appropriate level of care. Structural, financial, and cultural barriers to care must be identified and eliminated to allow access to prenatal care for all pregnant women.

Syphilis

Contact the STD/HIV/HCV Program at 406-444-3565.

Background

Syphilis is a sexually transmitted infection caused by the bacterium *Treponema pallidum*. Syphilis is most commonly transmitted through sexual contact, but it is also transmitted vertically from a pregnant woman to her unborn child, resulting in congenital syphilis. Congenital syphilis continues to rise at concerning rates. From 2012-2021, the number of reported congenital syphilis cases increased 755% nationwide. In Montana, the annual number of congenital syphilis cases increased 1800% from 2019 to 2023.

Congenital syphilis is preventable through timely testing and adequate treatment of syphilis during pregnancy. It is estimated that the lack of timely testing and provision of adequate treatment during pregnancy contributed to 88% of congenital syphilis cases nationwide in 2022 (McDonald, et. al, 2023). Addressing these missed prevention opportunities, primarily by offering timely testing and administering appropriate treatment of syphilis during pregnancy is crucial for reversing congenital syphilis trends in Montana.

For more information:

- Congenital Syphilis: A U.S. Perspective - PMC (nih.gov)
- Vital Signs: Missed Opportunities for Preventing Congenital Syphilis — United States, 2022 | MMWR (cdc.gov)

Syphilis Testing During Pregnancy

Effective prevention of congenital syphilis depends on identifying and appropriately treating syphilis among pregnant women. When women of reproductive age are treated for syphilis, pregnancy status should be established and documented. To reduce perinatal transmission, routine serologic screening of pregnant women in Montana is recommended during the first prenatal visit, 28 weeks gestation, and at delivery. When access to prenatal care is not optimal, screening, and treatment (if indicated) should be performed as soon as pregnancy is identified with a positive pregnancy test or at any opportunity early in pregnancy (e.g., presentation for non-pregnancy related care).

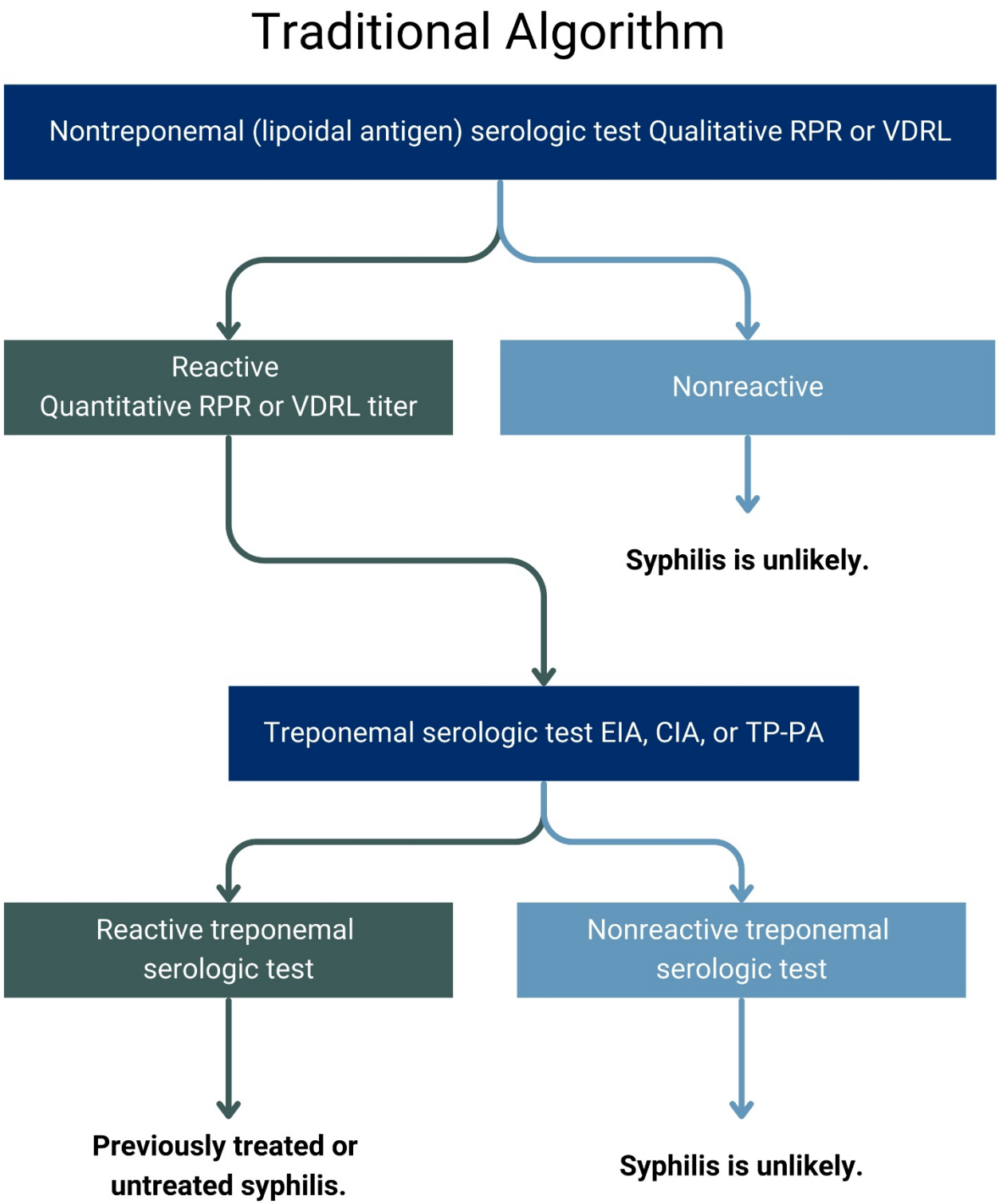
Recall that two positive tests are required to establish a diagnosis of syphilis. Recently, there have been several instances in which nontreponemal and treponemal testing have not been paired for a possible syphilis case, resulting in diagnostic and clinical management challenges. Briefly, the traditional syphilis screening algorithm begins with a nontreponemal (e.g., rapid plasma reagin (RPR), Venereal Disease Research Laboratory (VDRL)) test, and any reactive specimens are tested for confirmation by a treponemal test (e.g., *T. pallidum* particle agglutination (TPPA), fluorescent treponemal antibody-absorption (FTA-ABS)). For the reverse syphilis screening algorithm, initial screening with an automated treponemal test (e.g., enzyme immunoassay (EIA), chemiluminescence immunoassay (CIA)) of a sample with a positive result must be followed by a quantitative nontreponemal (e.g., RPR, VDRL) test. When the reverse sequence algorithm is used, any discordant results should be adjudicated by a second treponemal assay (e.g., TPPA) that has a different format and includes different antigens (Papp, J., et al. 2024) (see Figure 1 below).

Appropriate syphilis screening and treatment of pregnant women is the foundation of congenital syphilis prevention. Communities should also identify missed opportunities (e.g., lack of screening) to prevent congenital syphilis and treat syphilis during pregnancy as well as strategies to address missed opportunities identified.

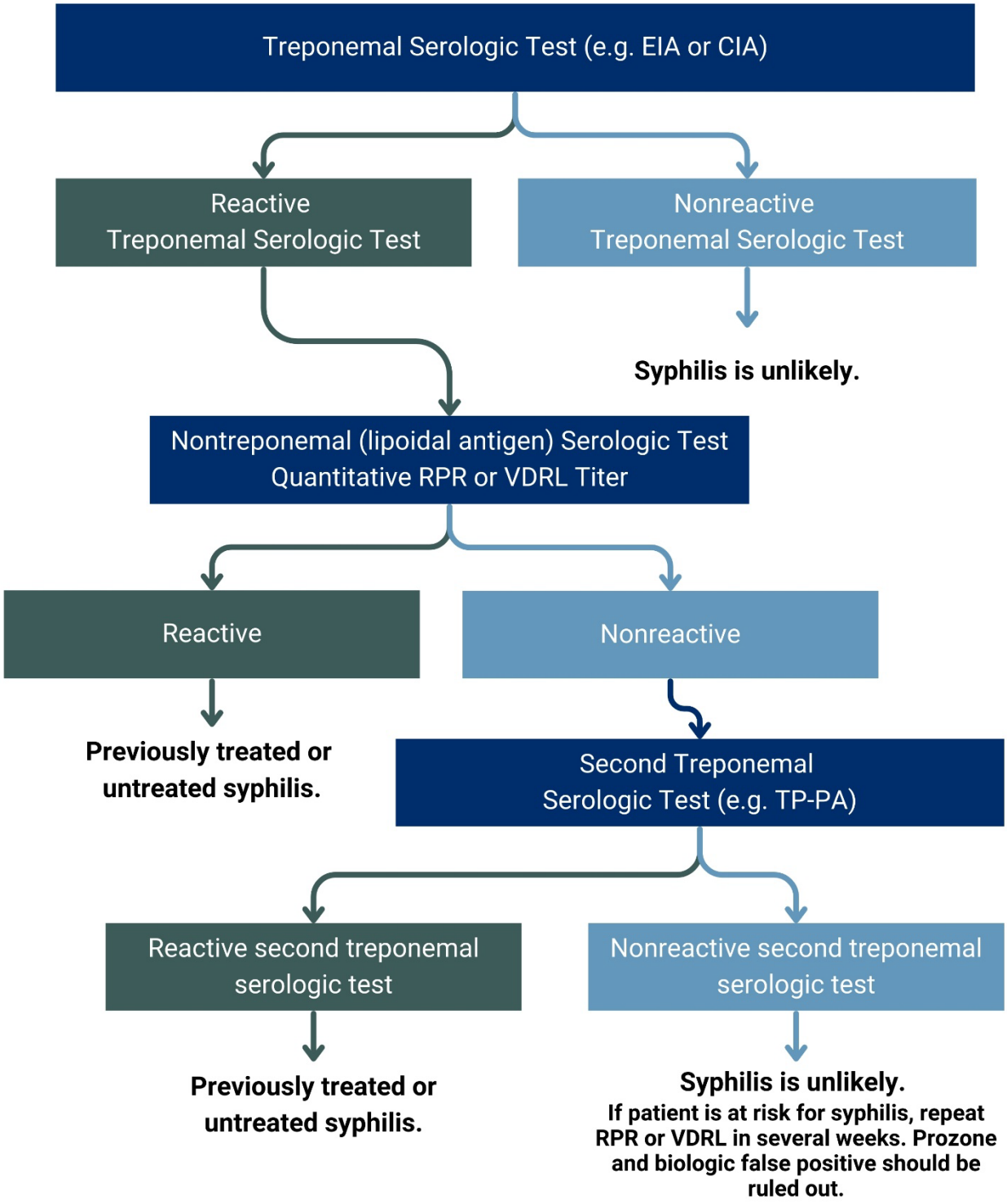
For more information:

- Sexually Transmitted Diseases (lww.com)
- Congenital Syphilis - STI Treatment Guidelines (cdc.gov)
- The Diagnosis, Management and Prevention of Syphilis (nycptc.org)

Figure 1: Traditional and Reverse Sequence Algorithms for Syphilis Testing (Papp, J., et al. 2024)



Reverse Sequence Algorithm



Syphilis Treatment During Pregnancy

Congenital syphilis is preventable by treating the mother with the appropriate antimicrobials and follow up screening during pregnancy. Treatment should be completed immediately after diagnosis. Benzathine penicillin G (Bicillin® L-A) is the only known effective treatment for syphilis in pregnancy. Pregnant women should be treated with the recommended penicillin regimen for their stage of infection and the regimen must be initiated at least 30 days prior to delivery. For treatment of syphilis late latent or unknown duration, a 7-day interval between the three doses of Bicillin® L-A is optimal. The treatment dosing interval during pregnancy must not exceed 9 days. The regimen must be restarted if not given within the 7-to-9-day interval.

Treatment with Bicillin® L-A is imperative during pregnancy and a penicillin allergy is not an acceptable reason to forego Bicillin® L-A treatment. If a penicillin allergy is reported, a referral should be placed for allergy testing and desensitization.

Treatment could be considered inadequate based on inappropriate selection of an antimicrobial agent, incorrect dosing or spacing of doses, or insufficient interval between initiation of treatment and delivery. Strategies that reduce loss to follow-up and decrease the time between testing and treatment could increase the likelihood of adequate treatment. Innovations in treatment and close follow up (e.g., field-delivered treatment and PHN/DIS trained to provide linkage to care) can help ensure adequate treatment.

For more information:

- Syphilis During Pregnancy - STI Treatment Guidelines (cdc.gov).
- Vital Signs: Missed Opportunities for Preventing Congenital Syphilis — United States, 2022 | MMWR (cdc.gov)
- Syphilis - STI Treatment Guidelines (cdc.gov)
- Sample Field Based Treatment Policy: Field-Based-Syphilis-Policy.docx (live.com)

Monitoring Maternal Titers

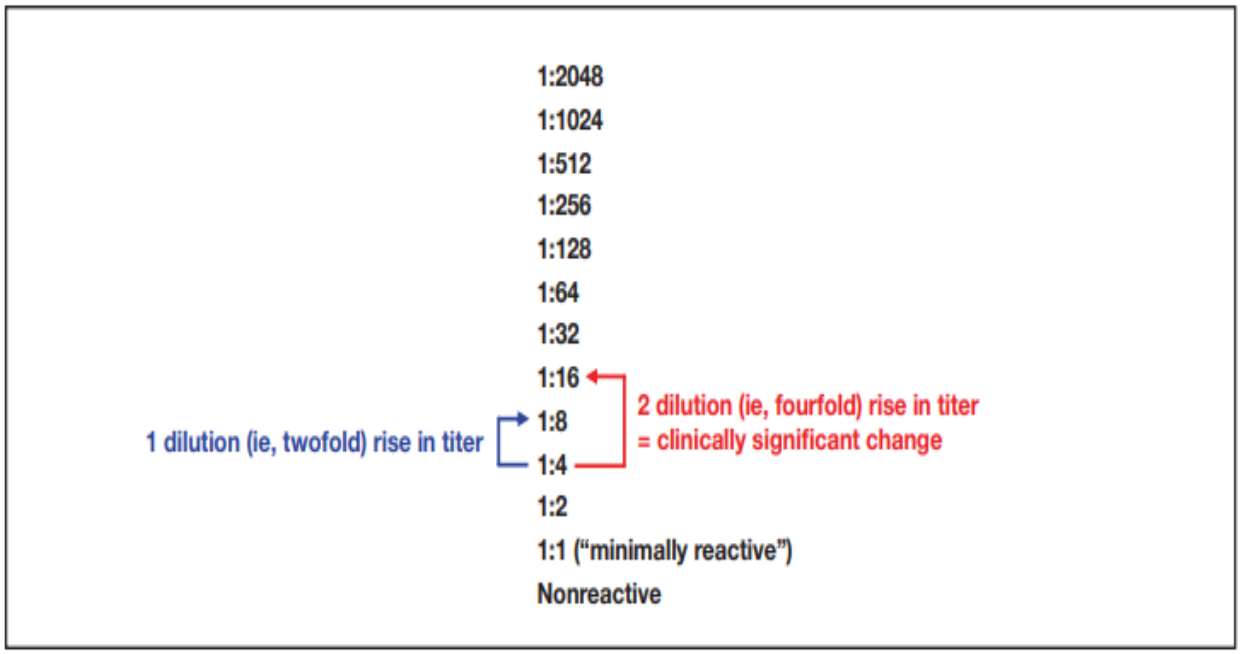
According to the CDC guidelines, when syphilis is diagnosed and treated at or before 24 weeks gestation, serologic titers should not be repeated before eight weeks after treatment and should be repeated at delivery. Titers should be repeated sooner if reinfection or treatment failure is suspected. For syphilis diagnosed and treated after 24 weeks gestation, serologic titers should be repeated at delivery. Most pregnant women will not achieve a fourfold decrease in titers before delivery, but this does not necessarily indicate treatment failure. Maternal nontreponemal testing at the time of delivery should be paired with infant testing for comparison of the maternal and fetal titers. This information is crucial for establishing whether the infant should be treated.

Retesting During Pregnancy

Weeks	Retesting schedule
At or before 24 weeks gestation	Should not be repeated before 8 weeks after treatment and should be repeated at delivery
After 24 weeks gestation	Repeat at delivery

Watch closely for a fourfold (equivalent to 2-dilution) increase in maternal titer for concern of reinfection or treatment failure. If a fourfold increase in the maternal titer is identified, immediately contact the provider for follow up and possible treatment.

Figure 2: Example of Quantitative Nontreponemal Titers That Indicate a Clinically-Significant Change



Reference: New York City Department of Health and Mental Hygiene, and the New York City STD Prevention Training Center. The Diagnosis and Management of Syphilis: An Update and Review. March 2019. A PDF version is available at: https://www.publichealth.columbia.edu/research/centers/new-york-city-sti-hiv-prevention-training-center

For more information:
Syphilis During Pregnancy - STI Treatment Guidelines (cdc.gov) Page 51

Partner Services

Partner services and contact tracing are a crucial components of syphilis investigations, particularly for the pregnant patient to prevent maternal reinfection post-treatment. The provision of partner services involves interviewing the pregnant woman and identifying sexual partners who need to be evaluated, tested, and treated for syphilis. Current sex partner(s) need to be adequately treated for syphilis to prevent reinfection of the pregnant patient and subsequent infection in the fetus.

Public Health Follow-Up for Pregnant Women with Syphilis

Once a pregnant woman tests positive for syphilis, the public health professional should continue to follow pregnant women throughout their pregnancy and at delivery to ensure appropriate follow up for mother and infant is in place. When the infant is born, public health should ensure that both mother and infant are evaluated for syphilis regardless of treatment delivered during pregnancy.

Essential Steps Throughout Pregnancy and at Delivery

- Screen for syphilis three times during pregnancy.
- If syphilis is detected and treated during pregnancy, perform laboratory testing at appropriate intervals to assess for reinfection and/or treatment failure.
- The same quantitative test should be used throughout this time period. Use the same laboratory for all testing, when feasible, to ensure comparability of results and to allow for accurate patient monitoring in response to treatment. Nontreponemal tests (e.g., RPR, VDRL) are not interchangeable when used to determine antibody titers; testing on follow up samples must be performed with the same type of test. Compare RPRs only to RPRs and VDRLs only to VDRLs.
- Complete partner services and notification. All sexual partners should receive testing and treatment for syphilis. Partner notification for pregnant woman with syphilis should be prioritized.
- The pregnant woman and her partner must abstain from sexual activity for at least seven days after the full treatment has been administered to both people.
- Ensure pregnant woman and their partners have been appropriately treated during the pregnancy. If they have not, elicit barriers to adequate treatment and work to address those barriers. Consider offering field treatment for the pregnant woman and her partner(s) if they are not engaged in prenatal care and/or syphilis treatment.
- For pregnant women diagnosed with syphilis during pregnancy:
    - Verify that the delivering provider has collected a non-treponemal titer for mother and infant after delivery and prior to hospital discharge. Establish the infant’s titer relative to the mother's titer. This information is essential for establishing a treatment plan for the mother and management recommendations for the infant.
    - Determine whether appropriate treatment was delivered to the pregnant woman during pregnancy and whether it was initiated at least 30 days

before delivery. All treatment must be documented. Public Health can determine dates of treatment by looking in an electronic health record or calling the provider's office. If the woman's syphilis was staged as late latent syphilis or syphilis of unknown duration, she must have been treated with three doses of benzathine penicillin G Bicillin® L-A 2.4 mU spaced seven to nine days apart. If any dose was spaced more than nine days apart, treatment was inadequate.

Tracking Pregnant Women with Syphilis:

- **Pregnancy status must be documented for every female syphilis case.**
- Create a spreadsheet of pregnant women with syphilis that includes MIDIS ID#, date of birth, Estimated Date of Confinement (EDC or Due Date), treatment details (e.g., antimicrobial, dose, date(s) administered), and tests conducted before, during, and after pregnancy, including type of test, date, and results. *See a sample spreadsheet here*.
- Monitor when pregnant women deliver their infant or experience a stillbirth.
- Don't close maternal case in MIDIS until after delivery labs are drawn and the congenital syphilis case determination is made.
- Link to Congenital Syphilis (CS) training and demo: MIDIS Office Hours: Congenital Syphilis MIDIS Page - 7/6/2023 (dphhselearn.org)

Outreach activities for consideration:

- How do you find women who are pregnant and do not go to prenatal care?
- Does your organization have the capacity of test and treat syphilis in the field?
- If possible, rule out pregnancy in cases of women being treated for syphilis.

Surveillance for syphilitic stillbirths:

- Collaborate with FICCMR leader to review cases of stillbirth and infant death for maternal syphilis testing and/or infection.

Conduct active surveillance of pregnant women diagnosed with syphilis during pregnancy to monitor for outcome of the pregnancy, live birth, or stillbirth. If the pregnancy outcome is a live birth, determine whether the infant meets the case definition for congenital syphilis. If the pregnancy outcome is stillbirth, determine whether the case meets case definition for syphilitic stillbirth.

For more information:

- Congenital Syphilis: A Persisting Sentinel Public Health Eve... : Sexually Transmitted Diseases (lww.com)
- Vital Signs: Missed Opportunities for Preventing Congenital Syphilis — United States, 2022 | MMWR (cdc.gov)
- CDC Passport to Partner Services: Partner Services | Diagnose | Effective Interventions | HIV/AIDS | CDC
- CDC Internet Partner Services Toolkit: IPS Toolkit (cdc.gov)
- American Indian Community Outreach materials: Resources | Native Health Resources

Congenital Syphilis

Contact the STD/HIV/HCV Program at 406-444-3565.

Background

Congenital Syphilis (CS) is an infection in an infant or fetus, acquired during pregnancy when a pregnant woman has untreated or inadequately treated syphilis. CS happens when the bacteria crosses the placenta and infects the fetus during pregnancy. Transmission can occur at any point in pregnancy or at any stage of syphilis, but transmission to the fetus is most common when mom has early syphilis. CS can cause miscarriage, stillbirth, prematurity, low birth weight, or death shortly after birth. Congenital syphilis is a sentinel public health event that suggests a failure of both public health and the health care system to prevent an adverse birth outcome.

The following section will outline the appropriate diagnostic evaluation of a neonate for congenital syphilis diagnosis, possible clinical scenarios that clinicians might encounter, and surveillance definitions of congenital syphilis and syphilitic stillbirth. It is important to recognize that the surveillance definition and clinical diagnosis may not match.

For more information:

- Congenital Syphilis | NCBDDD | CDC Congenital Syphilis | NCBDDD | CDC
- Congenital Syphilis: A Persisting Sentinel Public Health Event Congenital Syphilis: A Persisting Sentinel Public Health Eve... : Sexually Transmitted Diseases (lww.com)

Evaluation of Neonate for Congenital Syphilis

Serologic Testing of Neonate

All neonates born to women with reactive syphilis serologic tests should have quantitative nontreponemal serologic testing (RPR or VDRL) completed at delivery.

Diagnosis of congenital syphilis can be difficult because maternal nontreponemal and treponemal antibodies can be transferred through the placenta to the fetus, complicating the interpretation of reactive serologic tests for syphilis among neonates (infants aged <30 days). Treponemal test (TP-PA, immunoassay-EIA, CIA or microbead

immunoassay) on neonatal serum is not recommended because it is difficult to interpret, as passively transferred maternal antibodies can persist for over 15 months. The nontreponemal test ordered for mother should match the type ordered for the neonate.

Treatment decisions for the neonate frequently must be made based on the identification of syphilis in the mother; the adequacy of maternal treatment; the presence of clinical, laboratory, or radiographic evidence of syphilis in the neonate; and the comparison of the same nontreponemal titers for the mother and neonate collected at delivery, preferably using the same lab.

For more information:

- Congenital Syphilis - STI Treatment Guidelines (cdc.gov)

Physical Exam of Neonate

All neonates born to women with reactive nontreponemal serologic syphilis testing at delivery should be examined for congenital syphilis. Some infants born with early congenital syphilis are asymptomatic at birth and may develop signs or symptoms weeks, months or years later. Early signs of CS develop in the first two years of life.

Clinical manifestations of early congenital syphilis include: (Congenital Syphilis - Pediatrics - Merck Manual Professional Edition (merckmanuals.com))

- Rhinitis ('snuffles"),
- Hepatosplenomegaly,
- Jaundice,
- Skin rash with desquamation,
- Brain and nerve problems, like blindness or deafness,
- Meningitis,
- Bone abnormalities (long bones), or
- severe anemia.

Clinical manifestations of late CS can appear after two years of age and can be prevented by treatment in the first three months of life.

Clinical manifestation of late CS (after two years of age) includes the following: (Congenital Syphilis - Pediatrics - Merck Manual Professional Edition (merckmanuals.com))

- Hutchinson's triad (notched incisors, interstitial keratitis, and eighth cranial nerve deafness);
- Developmental delays;
- Intellectual disabilities;
- Saddle nose; or
- Saber shins.

Figure 3: Clinical Case Scenarios Congenital Syphilis - STI Treatment Guidelines (cdc.gov)

Scenario 1: Confirmed, proven or highly probable congenital syphilis	**Scenario 2:** Possible congenital syphilis
Neonate with: • a physical exam consistent with CS • serum quantitative nontreponemal serology 4-fold greater than mother's **OR** • a positive darkfield or PCR test of placenta, body fluids, or positive silver stain of placenta or cord.	**Neonate with** a normal physical exam and a serum quantitative nontreponemal serologic titer equal to or < 4-fold of the maternal titer at delivery and **ONE** of the following: • The mother was not treated, was inadequately treated, or has no documentation of treatment. • The mother was treated with erythromycin or a regimen not recommended in these guidelines. • The mother received recommended regimen but treatment was initiated <30 days before delivery.
Evaluation: CSF with VDRL, cell count, protein, CBC/diff, long bone radiographs, neurological eval (eye, auditory, imaging).	**Evaluation:** CSF with VDRL, cell count, protein**, CBC/diff, long bone radiographs
Treatment: **Aqueous crystalline penicillin G** 100,000 – 150,000 units / kg body wt. / day, administered as 50,000 units/kg body wt. / dose IM in a single daily dose for 10 days.	**Treatment:** **Aqueous crystalline penicillin G** 100,000 – 150,000 units / kg /body wt. /day, administered as 50,000 units / kg body wt. / dose IV q 12 hours during the first 7 days of life and q 8 hours thereafter for a total of 10 days **OR** **Procaine penicillin G** 50,000 unites / kg body weight / dose IM in a single daily dose for 10 days **OR** **Benzathine penicillin** 50,000 units / kg body wt. single IM injection

Scenario 3: Congenital syphilis less likely	**Scenario 4:** Congenital syphilis unlikely
Neonate with a normal physical exam and a serum quantitative nontreponemal serologic titer equal or <4-fold of the maternal titer at delivery and **BOTH** of the following are true: • The mother was treated during pregnancy, treatment was appropriate for the infection stage, and the treatment regimen was initiated ≥ 30 days before delivery. • The mother has no evidence of reinfection or relapse.	**Neonate with:** • A normal physical exam • Serum quantitative nontreponemal serology equal to or less than 4-fold the mother's titer at delivery **AND** • Mother's treatment was adequate before pregnancy. • Mother's nontreponemal titer remained low and stable before and during pregnancy and at delivery.
Evaluation: No evaluation is recommended.	**Evaluation:** No evaluation is recommended.
Treatment: **Benzathine penicillin G** 50,000 units / kg body weight / done IM in a single dose. *Another approach involves not treating the newborn if follow-up is certain but providing close serologic follow-up every 2-3 months for 6 months for infants whose mothers' nontreponemal titers decreased at least 4-fold after therapy for early syphilis or remained stable for low titer, latent syphilis (VDRL <1:2 pr RPR <1:4).	**Treatment:** **No treatment recommended.** • Benzathine penicillin 50,000 units / kg body weight as a single IM injection might be considered if follow-up is uncertain and the neonate has a reactive nontreponemal test. • Neonates should be followed serologically to ensure the nontreponemal test returns to negative.

Congenital Syphilis Case Classification

For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis among infants and children as well as syphilitic stillbirths.

Clinical Description

A condition caused by infection in utero with *Treponema pallidum*. A wide spectrum of severity exists, from inapparent infection to severe cases that are clinically apparent at birth. An infant or child (aged less than two years) may have signs such as hepatosplenomegaly, rash, condyloma lata, snuffles, jaundice (nonviral hepatitis), pseudoparalysis, anemia, or edema (nephrotic syndrome and/or malnutrition). An older child may have stigmata (e.g., interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson teeth, saddle nose, rhagades, or Clutton joints).

Laboratory Criteria for Diagnosis

Demonstration of *Treponema pallidum* by:

- Darkfield microscopy of lesions, body fluids, or neonatal nasal discharge, **OR**
- Polymerase chain reaction (PCR) or other equivalent direct molecular methods of lesions, neonatal nasal discharge, placenta, umbilical cord, or autopsy material, **OR**
- Immunohistochemistry (IHC), or special stains (e.g., silver staining) of specimens from lesions, placenta, umbilical cord, or autopsy material.

Case Classification

Probable

1. A condition affecting an infant whose mother had untreated or inadequately treated* syphilis at delivery, regardless of signs in the infant **OR**
2. An infant or child who has a reactive non-treponemal test for syphilis (Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [RPR], or equivalent serologic methods) **AND** any one of the following:
    - Any evidence of congenital syphilis on physical examination (see Clinical description)
    - Any evidence of congenital syphilis on radiographs of long bones
    - A reactive cerebrospinal fluid (CSF) venereal disease research laboratory test (VDRL) test

- In a non-traumatic lumbar puncture, an elevated CSF leukocyte (white blood cell, WBC) count or protein (without other cause):
  - Suggested parameters for abnormal CSF WBC and protein values:
    1. During the first 30 days of life, a CSF WBC count of >15 WBC/mm3 or a CSF protein >120 mg/dl is abnormal.
    2. After the first 30 days of life, a CSF WBC count of >5 WBC/mm3 or a CSF protein >40 mg/dl, regardless of CSF serology. The treating clinician should be consulted to interpret the CSF values for the specific patient.

*Adequate treatment is defined as completion of a penicillin-based regimen, in accordance with CDC treatment guidelines, appropriate for stage of infection, initiated 30 or more days before delivery.

Confirmed

A case that is laboratory confirmed.

Comments

Congenital and acquired syphilis may be difficult to distinguish when a child is seropositive after infancy. Signs of congenital syphilis may not be obvious, and stigmata may not yet have developed. Abnormal values for CSF VDRL, WBC count, and protein may be found in either congenital or acquired syphilis. Findings on radiographs of long bones may help because radiographic changes in the metaphysis and epiphysis are considered classic signs of congenitally acquired syphilis. While maternal antibodies can complicate interpretation of serologic tests in an infant, reactive tests past 18 months of age are considered to reflect the status of the child. The decision may ultimately be based on maternal history and clinical judgment. In a young child, the possibility of sexual abuse should be considered as a cause of acquired rather than congenital syphilis, depending on the clinical picture.

Syphilitic Stillbirth

A fetal death that occurs **after a 20-week gestation** or in which the fetus weighs **greater than 500 grams** and the mother had untreated or inadequately treated* syphilis at delivery.

*Adequate treatment is defined as completion of a penicillin-based regimen, in accordance with CDC treatment guidelines, appropriate for stage of infection, initiated 30 or more days before delivery.

For more information:

- Syphilis, Congenital 2018 Case Definition | CDC
- Syphilis - STI Treatment Guidelines (cdc.gov)
- P&S Syphilis - STI Treatment Guidelines (cdc.gov)
- Latent Syphilis - STI Treatment Guidelines (cdc.gov)

Follow-Up for Neonates

All neonates with reactive nontreponemal tests should receive follow-up examinations and serologic testing (RPR or VDRL) every two to three months until the test becomes nonreactive.

For a neonate who was not treated because CS was considered less likely or unlikely, nontreponemal titers should decrease by three months of age and be nonreactive by six months, which indicates the reactive test was a result of passive transfer of maternal antibodies. If at age six months, the nontreponemal test is nonreactive then no further evaluation or treatment is needed. If the nontreponemal test is still reactive, the infant is likely infected and should be treated.

Neonates who have received treatment who have persistent nontreponemal titers by age 6-12 months should be evaluated through cerebrospinal fluid (CSF) examination and managed in consultation with an expert. Retreatment with a 10-day course of a penicillin G regimen might be indicated.

Neonates with negative nontreponemal testing at birth whose mother was seroreactive at delivery should be retested at three months to rule out serologically negative incubating congenital syphilis at the time of birth. Treponemal tests should not be used to evaluate treatment response because passive transfer of maternal antibodies might persist for >15 months.

Neonates whose initial CSF evaluations are abnormal do not need repeat lumbar puncture unless they exhibit persistent nontreponemal serologic test titers at age 6–12 months. Persistent nontreponemal titers and CSF abnormalities should be managed in consultation with an expert.

For more information:

- Congenital Syphilis - STI Treatment Guidelines (cdc.gov)

Reporting

Cases of syphilis and congenital syphilis should be reported to the DPHHS Communicable Disease and Epidemiology section or local health department in accordance with requirements for reporting syphilis infections (ARMS 37.114.203). Case definitions for reportable cases have been published by the Council of State and Territorial Epidemiologists

The congenital syphilis reporting form can be found here: Congenital Syphilis Form (mt.gov)

Breastfeeding

There is no evidence to contradict breastfeeding for a person with syphilis if the baby or pumping equipment does not touch a sore.

Exclusion from School or Daycare

Congenital syphilis does not currently have any school or daycare exclusions, though reporting of syphilis/congenital syphilis is mandated in Montana per Administrative Rules of Montana 37.114.203.

Children who are jaundiced must be excluded from Montana daycares until a health care provider evaluates the case and authorizes the child to return to the day care facility, as per ARM 37.95.139.

For more information:

- Communicable Disease Guide for Schools and Daycares in Montana (mt.gov)

Public Health Worksheet: Syphilis/Congenital Syphilis

Investigator (PHN/DIS): _____

Jurisdiction: _____ Date: _____

Maternal	
MIDIS ID	
Name	
Phone	
Estimated Due Date (EDD)	
Gestational Age of Fetus at Maternal Date of Diagnosis	
Gestational Age of Fetus at Delivery	
Maternal Provider Name	
Maternal Provider Phone	

Maternal Testing		
Initial Treponemal Test (TPPA, EIA, CIA)	Type: Date: Result:	
Initial Nontreponemal Titer/Dilution (RPR, VDRL)	Type: Date: Result: Titer:	
Syphilis Stage	☐ Primary ☐ Secondary ☐ Early Latent ☐ Late Latent/Unknown	
Treatment Dates	Date of Treatment 1:	
(7-9 Day Interval)	Interval:	
	Date of Treatment 2:	
(7-9 Day Interval)	Interval:	
	Date of Treatment 3:	

Follow-Up Testing During Pregnancy	
Nontreponemal Titer / Dilution (RPR, VRDL)	Type: Date: Result: Titer:
Was there a 4-fold titer change? **Must compare RPR to RPR and VDRL to VDRL**	☐ Yes ☐ No
If yes, was there an increase or decrease?	☐ Increase (suggests treatment failure or reinfection) ☐ Decrease (suggests successfully treated)

Follow-Up Testing at Delivery	
Nontreponemal Titer / Dilution (RPR, VRDL)	Type: Date: Result: Titer:
4-fold titer change since initiation of treatment? **Must compare RPR to RPR and VDRL to VDRL**	☐ Yes ☐ No

Maternal Treatment		
Date of Delivery:	☐ Live Birth ☐ Stillbirth	
Was Maternal Treatment Initiated at least 30 days prior to delivery?	Date Treatment Initiated: Interval between Date Treatment Initiated and Date of Delivery:	
Was Maternal Treatment Regimen Completed at Time of Delivery?	☐ Yes* ☐ No+	
*If Yes, Dates of Treatment:	Date of Treatment 1:	
	Interval:	
	Date of Treatment 2:	
	Interval:	
	Date of Treatment 3:	
+If No, then Infant needs further evaluation, See Figure 3, Scenario 2		

Infant			
MIDIS ID		DOB	
Name			
Caregiver Name		Caregiver Number	
Infant Provider Name		Provider Number	

At Delivery: Infant		
Initial Treatment Recommended for Infant?	☐ Yes ☐ No	Notes:
Nontreponemal test at delivery (The infant's nontreponemal test should be the same type as the maternal test e.g. RPR & RPR or VDRL&VDRL)	Type (RPR or VDRL): Date: Result: Titer:	
Is the nontreponemal titer 4-fold higher than the maternal titer?	☐ Yes⊥ ☐ No	
Did infant have an CS finding on physical exam?	☐ Yes⊥ ☐ No	Notes:
⊥If yes, then infant is classified as proven or highly probable CS case and needs further evaluation and treatment (Scenario 1 in Figure 3)		

Follow-Up Testing for Infant						
Nontreponemal Testing 1	Type		Date		Titer	
Nontreponemal Testing 2	Type		Date		Titer	
Nontreponemal Testing 3	Type		Date		Titer	
Did Infant's Nontreponemal Test Decrease to Nonreactive by 6 months?	☐ Yes ☐ No×					
×If no, was infant referred for further evaluation and treatment?	☐ Yes ☐ No					
Treatment:	Notes:					

Questions? Contact STD/HIV/HCV Program Prevention: 406-444-3565

Sample Tracking Spreadsheet for Maternal Syphilis Cases

EDD	Maternal MIDIS ID #	DOB	Stage	Treatment Date(s)	Test Date	Type / Results	Test Date	Type / Results

Resources

Consults — University of Washington STD Prevention Training Center (uwptc.org) [urldefense.us]
The timeframe is 1-5 business days for a response.

Docs- Prenatal/CS Clinical Pocket Card, CS Algorithm and Neurosyphilis Screening Tool (from UW website) General 5 — University of Washington STD Prevention Training Center (uwptc.org)

National STD Curriculum: Quick Reference Self Study Lessons and STD Podcasts (Free educational website from U of W) National STD Curriculum (uw.edu) [urldefense.us]

UMT DIS Training Disease Intervention Specialist (DIS) (umt.edu)

Sample Field Based Treatment Policy: Field-Based-Syphilis-Policy.docx (live.com)

Native Health Resources - Healthy Native Youth

Evaluation and treatment of Infants (<30 days old) exposed to syphilis in utero algorithm: Congenital Syphilis Algorithm (ca.gov)

References

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Hepatitis B

The Montana Immunization Program oversees coordination of monitoring infants born to Hepatitis B virus (HBV) positive mothers within the state of Montana.

Background

Hepatitis B is a liver disease caused by the Hepatitis B virus (HBV). Once the virus enters the body, it attacks the liver cells and can cause extensive damage. This can result in liver failure, cirrhosis, liver damage, and cancer of the liver. The disease can be acute or chronic and recurring for the lifetime of a patient. Vaccination helps with prevention of the disease, and universal screening is now recommended by the CDC for all adults, at least once during a lifetime. *Many people with chronic HBV are unaware of their infection, as many will show no symptoms.*

HBV is highly infectious and can be transmitted by percutaneous, mucosal, or nonintact skin exposure to infectious blood, semen, and/or other body fluids. HBV is most highly concentrated in blood, and percutaneous exposure is an efficient mode of transmission. No concerns are noted for breastfeeding mothers with Hepatitis B at this time.

HBV is primarily spread through:

- Childbirth.
- Sexual contact.
- Sharing contaminated needles, syringes, or other equipment used to inject drugs.

Though less common, HBV can also be spread through:

- Needlesticks or other sharp instrument injuries.
- Organ transplantation and dialysis.
- Sharing items such as razors or toothbrushes.
- Contact with open sores of a person infected with HBV.

HBV infection in a pregnant woman poses a serious risk to an infant at birth. HBV screening for all pregnant women is important to prevent disease transmission and to identify the need for prophylactic treatment of infants. When a woman does not seek prenatal care, detection of Hepatitis B infection can be difficult.

Maternal Considerations

HepBPerinatalPrimaryReportDPHHS.pdf (mt.gov)

- All pregnant women should be tested for HBsAg during an early prenatal visit (e.g., first trimester) in each pregnancy, even if they have been vaccinated or tested previously. Testing those pregnant women known to be chronically infected with HBV provides documentation of the positive HBsAg test result obtained during pregnancy and helps to ensure that their infants will be identified for timely prophylaxis.
- The American Association for the Study of Liver Diseases (AASLD) (https://www.aasld.org/) offers two new recommendations regarding the clinical management of pregnant mothers with HBV.
    - All HBsAg-positive pregnant women should be tested for HBV DNA to guide the use of maternal antiviral therapy during pregnancy for the prevention of perinatal HBV transmission.
    - Offer maternal antiviral therapy for HBsAg-positive pregnant women when the maternal HBV DNA level is >200,000 IU/mL.
- All HBsAg-positive pregnant women should be referred to their jurisdiction's local health or tribal jurisdiction for case management to ensure that their infants receive timely prophylaxis and follow-up.
- A copy of the original laboratory report indicating the pregnant woman's HBsAg-positive status should be provided to the hospital or birthing facility where the delivery is planned and communicated to the healthcare provider who will care for the newborn infant.
- All HBsAg-positive pregnant women should receive information concerning HBV that discusses the potential use of antiviral therapy, the importance of prophylaxis for their infant (HepB vaccine and HBIG within 12 hours of birth), completion of the vaccine series, and postvaccination serologic testing.
- Women not tested prenatally, those with clinical hepatitis, and those whose behaviors place them at high risk for HBV infection should be tested at the time of admission to the hospital or birthing facility. High-risk behaviors include:
    - Recent or current injection-drug use,
    - More than one sex partner in the previous six months,
    - Sex with an HBsAg-positive sex partner,
    - Recent evaluation or treatment for a STI.
- All laboratories that provide HBsAg testing of pregnant women should use a Food and Drug Administration–licensed or approved HBsAg test and should

perform testing according to the manufacturer's labeling. This should include testing initially reactive specimens with a licensed neutralizing confirmatory test.
- Shortened testing protocols are acceptable, when necessary, at the time of delivery to expedite administration of post-exposure prophylaxis.
- If the mother's case investigation has not been opened in MIDIS, open an investigation in MIDIS.

Review sample *Public Health Worksheet: Perinatal Hepatitis B*.

Hepatitis Prophylaxis

Prophylactic treatment of Hepatitis B infection involves administering Hepatitis B vaccine and Hepatitis B Immunoglobulin (HBIG) to an infant born to a mother who tests positive for Hepatitis B surface antigen (HBsAg positive) within 12 hours of birth, followed by completion of the vaccine series and post-vaccination serologic testing.

Infants born to mothers whose HBsAg status is unknown should receive the HepB birth dose within 12 hours of birth. Infants weighing less than 2,000 grams should also receive HBIG within 12 hours of birth. The mother's HBsAg status should be assessed as soon as possible. If the mother is determined to be HBsAg-positive, infants weighing at least 2,000 grams should also receive HBIG as soon as possible but no later than age seven days. As with infants born to HBsAg-positive mothers, for infants weighing less than 2,000 grams, the birth dose should not be counted as part of the vaccine series because of potentially reduced immunogenicity; three additional doses of vaccine (for a total of four doses) should be administered beginning when the infant reaches age one month. Infants with mothers whose HBsAg status is unknown should receive the last dose by age six months but not before age 24 weeks.

The completion of the Hepatitis B series (doses at 0, 1-2, and 6 months) is important for adequate reduction of the risk of Hepatitis B infection.

Monitoring Infant Serology

After completing the Hepatitis B vaccine schedule, the infant born to an HBsAg-positive mother is tested at age 9-12 months, with anti-HBs methods that allow detection of protective concentration of anti-HBs (equal to or greater than 10 mIU/mL) to determine immunity. Testing should not be performed before nine months of age to avoid detection of passive anti-HBs from the HBIG administration at birth.

For more information:

- https://www.cdc.gov/mmwr/volumes/67/rr/rr6701a1.htm

Follow-Up for Neonates

All neonatal infants born to mothers of known HBV status or unknown HBV status should be followed up to age 24 months. Serological testing is recommended between age 9-12 months of age to determine immune status via laboratory testing.

Dates and times of administrations of the HBV vaccine are recorded and sent via secure file-send or fax to the **DPHHS Immunization Program (Fax no. 406.444.2920)** and a hard-copy is retained by the Immunization Nurse Consultant. Follow-up continues until serological testing is complete and the infant is found to be immune or completes post-serological testing prophylaxis if additional doses of vaccine are determined necessary. Send a copy of the form recording each vaccination date to the Immunization Program as the vaccines are given for tracking Hepatitis immunizations given to the infant.

CSTE Case definition

- Hepatitis B, Perinatal Infection 2017 Case Definition | CDC

Clinical Criteria: Perinatal HBV infection in a child at or under two years (24 months) of age may range from asymptomatic infection to fulminant hepatitis.

Laboratory Criteria: evidence of HBV infection in an infant consists of one or more of the following:

- Positive Hepatitis B surface antigen (HBsAg) test (only if done more than four weeks after last dose of Hep B vaccine)
- Positive hepatitis B e antigen (HBeAg) test.
- Detectable HBV DNA

Hepatitis B Case Classification

Hepatitis B is classified as either Acute, Chronic, or Perinatal infection based on criteria for each case classification.

Perinatal Case Classification

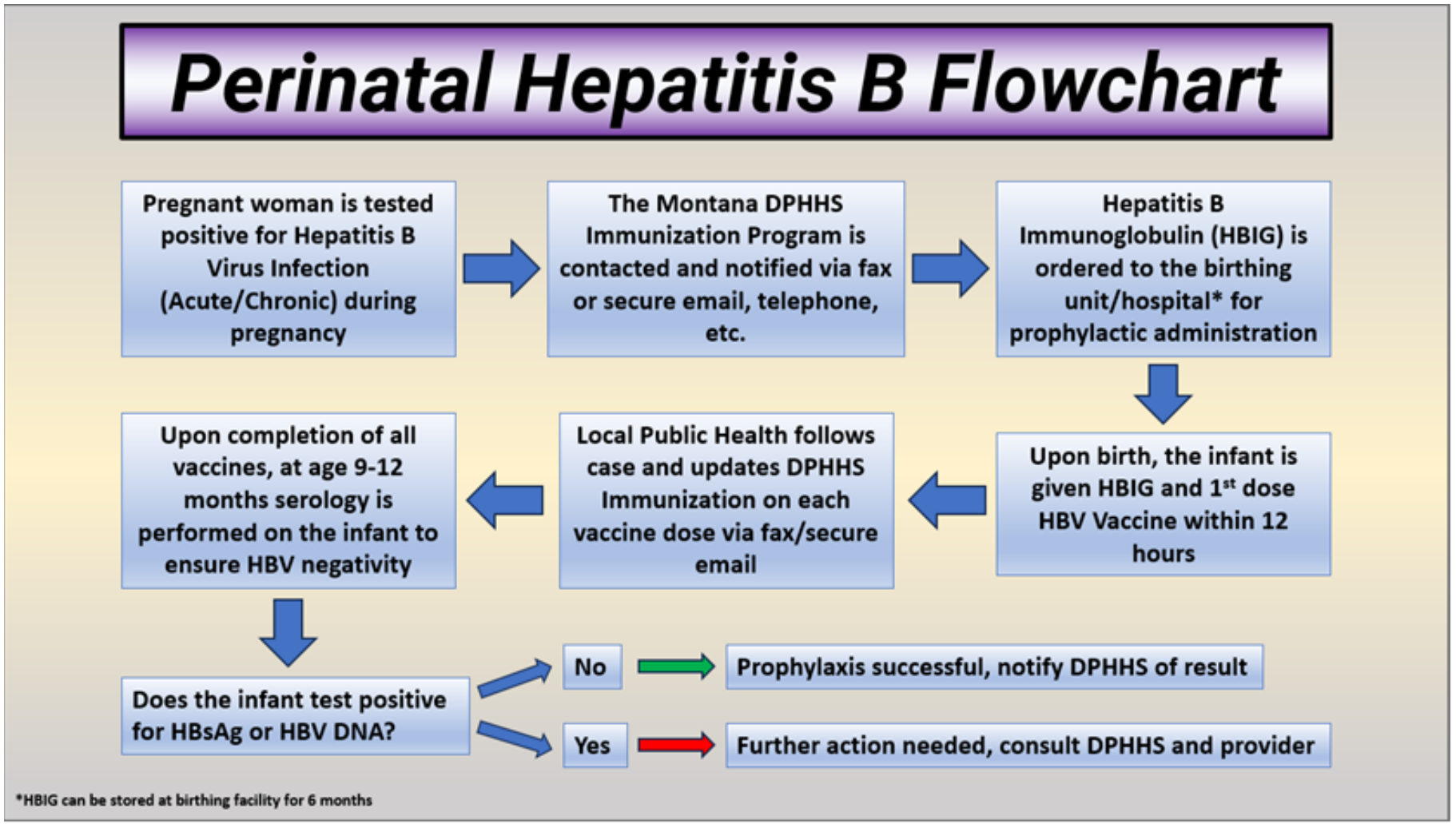
Probable

A child born in the United States and positive for HBsAg at ≥1 month of age and ≤24 months of age **OR** is positive for Hepatitis B e antigen (HBeAg) or HBV DNA at ≥9 months of age, and ≤24 months of age, but whose mother's hepatitis B status is unknown.

Confirmed

A Child born in the US to an HBV-infected mother and positive for surface antigen (HBsAg) at 1-24 months of age **OR** tests positive for HBeAg or HBV DNA at ≥ 9 months and ≤ 24 months of age.

Figure 5: Perinatal Hepatitis B Flowchart



Reporting

The Montana Perinatal Hepatitis B Prevention Program Primary Report for HBsAg Positive Pregnant Women, HepBPerinatalPrimaryReportDPHHS.pdf (mt.gov), and the Montana Perinatal Hepatitis B Prevention Program Infant Report, HepBPerinatalInfantReportDPHHS.pdf (mt.gov), are to be completed and faxed to the **DPHHS Immunization Program (Fax no. 406.444.2920).** This form is used to follow and track required hepatitis B vaccinations and lab work for infants born to a HBsAg positive mother per Administrative Rules of Montana 37.114.540. Questions about the reporting forms may be directed to the Immunization Program at 406.444.1805 or 406.444.5580.

Exclusion from School or Daycare

Hepatitis B does not currently have any school or daycare exclusions, though reporting of any infant (9-24 months) with Hep-B is mandated in Montana per Administrative Rules of Montana 37.114.540.

If an infant has jaundice, that is grounds for exclusion. Children with jaundice my return to daycare after healthcare provider clearance has been obtained.

For more information:

- Communicable Disease Guide for Schools and Daycares in Montana (mt.gov)

Montana Perinatal Hepatitis B Prevention Program

Primary Report
for HBsAg Positive Pregnant Women

Case Demographic

_____/_____ ___
Last Name First Name MI

____/____/____ _____
Birth date Country of Birth

Other Information

Hepatitis B: ☐ Acute ☐ Chronic

Estimated Date of Delivery (EDD) : ____/____/____

Healthcare Provider (mother): _____

Healthcare Provider (infant): _____

Anticipated Birth Facility: _____

Insurance Status: □ Private □ Public □ Uninsured □ Unknown

Complete all the above information and fax to Program Coordinator at 444-2920

____/____/____ Date HBIG was received at the birth facility

____/____/____ Date Birth Facility Report Form was delivered to birth facility

Additional Forms to be Completed (□ check and date when completed- for county use only)

□ __/__/____Montana DPHHS Communicable Disease Case Report

□ __/__/____ Perinatal Hepatitis B Prevention Program Primary Report

□ __/__/____ Contact Investigation Line List

□ __/__/____Hospital/Birth Facility Report

□ __/__/____Infant Report

Montana Immunization Program
For Questions please call 444-1805 or 444-5580
Fax (406) 444-2920
Revised 2/28/2013

Montana Perinatal Hepatitis B Prevention Program

Infant Report

Please use this form to follow and track required hepatitis B vaccinations and lab work required for infants born to a HBsAg positive mother per Administrative Rules of Montana 37.114.540

Reporting Process

Please fax a copy of this form after administration of each dose of vaccine and a copy of the final lab results to:

Local County Health Department (contact information)

Infant Information

_____	_____	_____	___/___/____
Infant Last Name	First Name	MI	Date of Birth
_____	_____	_____	___/___/____
Mother's Last Name	First name	MI	Date of Birth
_____	_____	_____	
Healthcare Provider Name	Phone	Fax	

Medical Information

Infant Birth Weight: _____gms/_____pounds

Insurance Status: : □ Private □ Public □ Uninsured □ Unknown

- Hepatitis B vaccine dose #1 date:_____ HBIG date:_____
- Hepatitis B vaccine dose #2 date:_____
- Hepatitis B vaccine dose #3 date:_____
- Hepatitis B vaccine dose #4 (if needed) date: _____
- Lab work: blood should be drawn no sooner than 9 months of age and 1-2 months after the last dose (dose 3 or 4) of Hepatitis B vaccine (generally at the next well-child visit). The lab work should be completed by 15-18 months of age. Both of the following tests need to be run:
  - **Hepatitis B Surface Antigen (HBsAg)**

    Date and results: _____
  - **Hepatitis B Surface Antibody (anti-HBs) (quantitative)**

    Date and result: _____

Montana Immunization Program
For Questions please call 444-1805 or 444-5580
(Revised 8/2012)

Public Health Worksheet: Perinatal Hepatitis B

Investigator (PHN/DIS): _____

Jurisdiction: _____ Date: _____

Maternal	
MIDIS ID	
Name	
Phone	
Estimated Date of Delivery	
Maternal Provider Name	
Maternal Provider Phone	
Has the Patient been tested for HBV surface antigen (HBsAg)?	☐ Yes Date: ☐ No NOTES:
Initial HBsAg test (Date)	
HBV classification of pregnant woman	☐ Chronic Date diagnosed: ☐ Acute ☐ Unknown NOTES:

Follow-Up Before Delivery	
Has MT DPHHS been notified of the pregnant woman with positive hepatitis B lab(s)?	☐ Yes Date: ☐ No
IS HBIG ordered?	☐ Yes Date ordered: ☐ No Date received:
Does the patient understand prophylactic vaccination completion importance?	☐ Yes ☐ No Date Patient Educated on Topic:

Infant			
MIDIS ID		DOB	
Name			
Infant Provider Name & Phone			

Infant Vaccination	
Initial Vaccine and HBIG	☐ Yes Date: ☐ No
Was serology done after birth?	☐ Yes Date: ☐ No
Was HBsAg detected?	☐ Yes ☐ No
Does the parent understand prophylactic vaccination and have dates to return for the infant's vaccinations?	☐ Yes ☐ No
Dose 1 (Birth, month 0)	Date Scheduled (if applicable): Date Administered:
Dose 2 (Month 1-2)	Date Scheduled: Date Administered:
Dose 3 (Month 6)	Date Scheduled: Date Administered:

Serological Testing (age 9+ months)	
Date of Testing	
Infant Age	
HBsAg Result	☐ Positive (+) HBsAg Date: ☐ Negative (-) HBsAg
Did the infant have any signs or symptoms of liver involvement?	☐ Yes Date: ☐ No NOTES:

Questions? Call the Immunization Program at 406.444.1805 or 406.444.5580.

Resources

HepBPerinatalPrimaryReportDPHHS.pdf (mt.gov)

HepBPerinatalInfantReportDPHHS.pdf (mt.gov)

https://dphhs.mt.gov/publichealth/immunization/PerinatalHepBResources

References

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Hepatitis C

Contact: MT DPHHS Communicable Disease and Epidemiology (CDEpi) section
406-444-0273

Background

Hepatitis C virus (HCV) is a blood-borne pathogen transmitted primarily through exposure to infected blood. Examples of methods of transmission of this virus include sharing contaminated injection drug use equipment, receipt of blood or blood products before the availability of standard screening tests in 1992, accidental needle sticks, and inadequate infection control in healthcare settings. In some circumstances, HCV transmission can occur among infants born to HCV-infected mothers either exposed during pregnancy or delivery.

Factors associated with increased risk of perinatal transmission:

- High viral load
- HIV co-infection
- Maternal blood exposure
- Membrane rupture lasting ≥6 hours before delivery and the use of internal fetal monitoring.

Unlike hepatitis B or HIV, there are currently no known methods to prevent transmission of HCV from mother to child.

In 2023, the Centers for Disease Control and Prevention (CDC) published a Morbidity and Mortality Weekly Report (MMWR) documenting the increasing prevalence of HCV in women of childbearing age and the potential public health consequences. During 2010–2021, hepatitis C virus infections increased in the United States, with associated health consequences including cirrhosis, liver cancer, and death. In 2023, about 40% of chronic and acute HCV cases in Montana occurred in women. Among those Montana women, 64% were of childbearing age (ages 15-45 years).

Perinatal hepatis C exposure can occur during pregnancy or delivery. Approximately 6% to 7% of perinatally exposed infants and children will acquire HCV infection. Curative direct-acting antiviral therapy is approved by the Food and Drug Administration for persons aged ≥3 years. However, many perinatally infected children are not tested or linked to care. CDC reports that the reasons for this might include lack of awareness of perinatal exposure by pediatric providers, lack of regular pediatric care among exposed infants and children, changes in health care providers before the time of HCV testing

(recommended at age 18 months), and challenging social circumstances for parents and guardians.

Data on the effects of HCV infection on pregnancy, birth, and neonatal outcomes have been mixed. Associations might be confounded by maternal substance use during pregnancy and unmeasured sociodemographic factors. However, certain studies have found associations between HCV infection and adverse birth and neonatal outcomes.

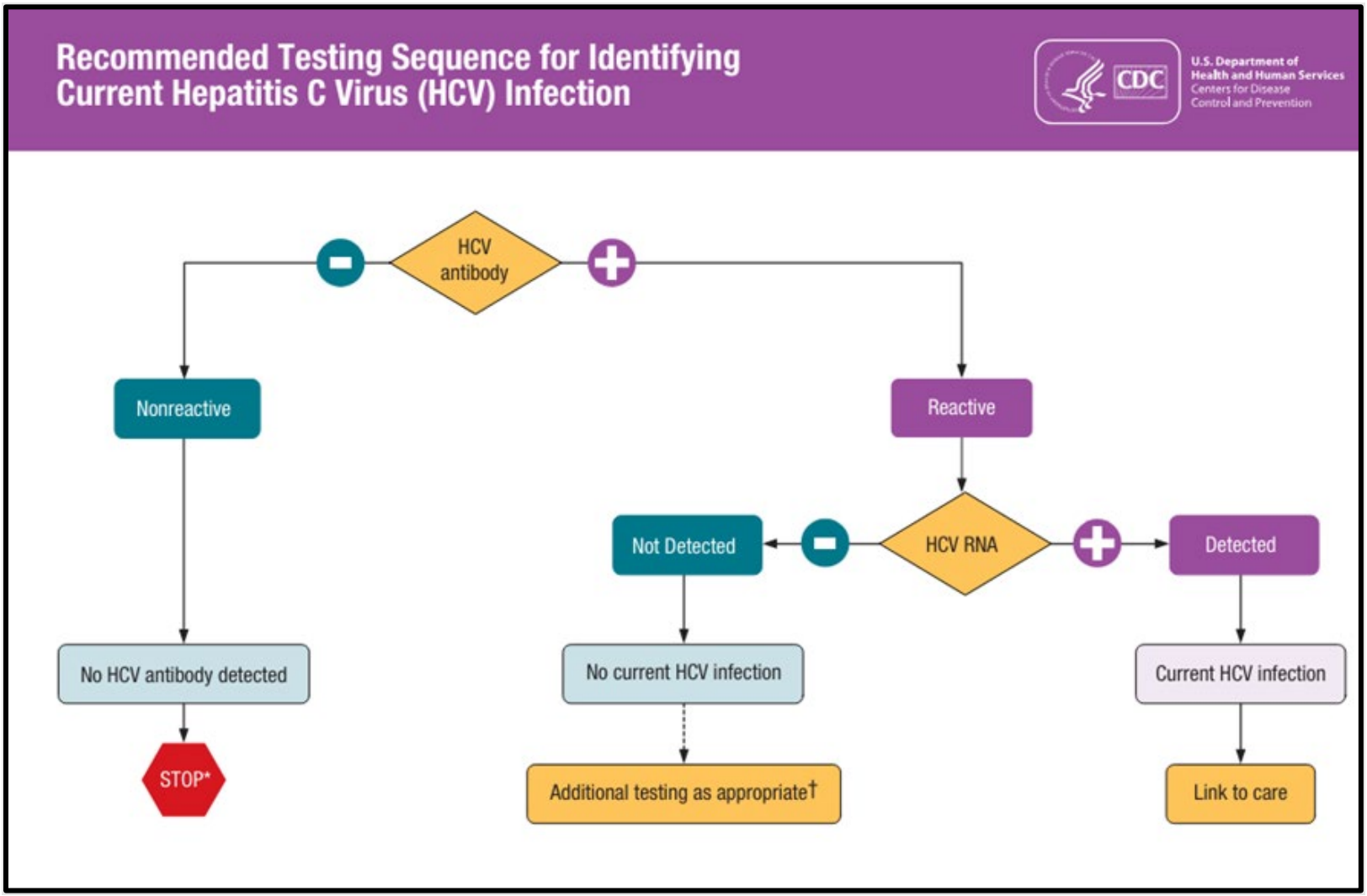
Clinical Features and Natural History of Perinatally Acquired HCV Infection

Among children with perinatally acquired HCV infection, spontaneous clearance of infection (i.e., resolution of the infection without treatment resulting in undetectable virus) typically occurs in 20%–40% of children by age five years. However, a study conducted in 2022 found that among 106 infants aged <36 months with current infection included in the analysis, 57.3% cleared by age three years and 65.9% cleared by age five years. Clearance is associated with sustained undetectable HCV RNA; viral RNA levels are initially high and then slowly decline. Antibody to hepatitis C virus (anti-HCV) typically persists for life but can wane over time.

Recommendations for HCV Screening of Pregnant Women

CDC recommends HCV screening for all pregnant women with an anti-HCV test during each pregnancy using the CDC testing algorithm (see MMWR recommendations).

Figure 6: Recommended Testing Sequence for Identifying Current Hepatitis C Virus (HCV) Infection



Source: [CDC Recommended HCV Testing Sequence]

Patient Follow-Up

The following follow up consideration are derived from CDC recommendations for hepatitis C testing among perinatally exposed infants and children (United States, 2023):

- Antibody testing should not be used for children under 18 months of age due to transient maternal HCV antibody that may not reflect actual infection status of the child.
- All infants and children born to pregnant women with current or probable hepatitis C virus infection should be tested for hepatitis C.
    - Pregnant women with detectable HCV RNA are considered to have current HCV infection. If anti-HCV testing is reactive and HCV RNA results are not available, pregnant women are considered to have probable HCV infection.
- Perinatally exposed infants should receive a nucleic acid test (NAT) for HCV RNA at age 2–6 months to identify children in whom chronic HCV infection might develop.* See the sample *Public Health Worksheet HCV Perinatal Follow-Up and Determination Tool*.
    - Infants with detectable HCV RNA should be managed in consultation with a health care provider with expertise in pediatric hepatitis C management.
    - Infants with undetectable HCV RNA do not require further follow-up.
- Other considerations
    - Infants and children aged 7–17 months who have not previously been tested should receive a NAT for HCV RNA.
    - Children aged ≥18 months who previously have not been tested should receive an anti-HCV test with reflex to NAT for HCV RNA.
- A health care provider may consider testing the siblings of children with perinatally acquired chronic HCV, if born from the same mother on a case-by-case basis.

**No further follow-up needed unless clinically warranted (e.g., clinical symptoms, signs, or laboratory findings consistent with hepatitis C).*

Figure 7: Perinatal HCV Case Determination Tool

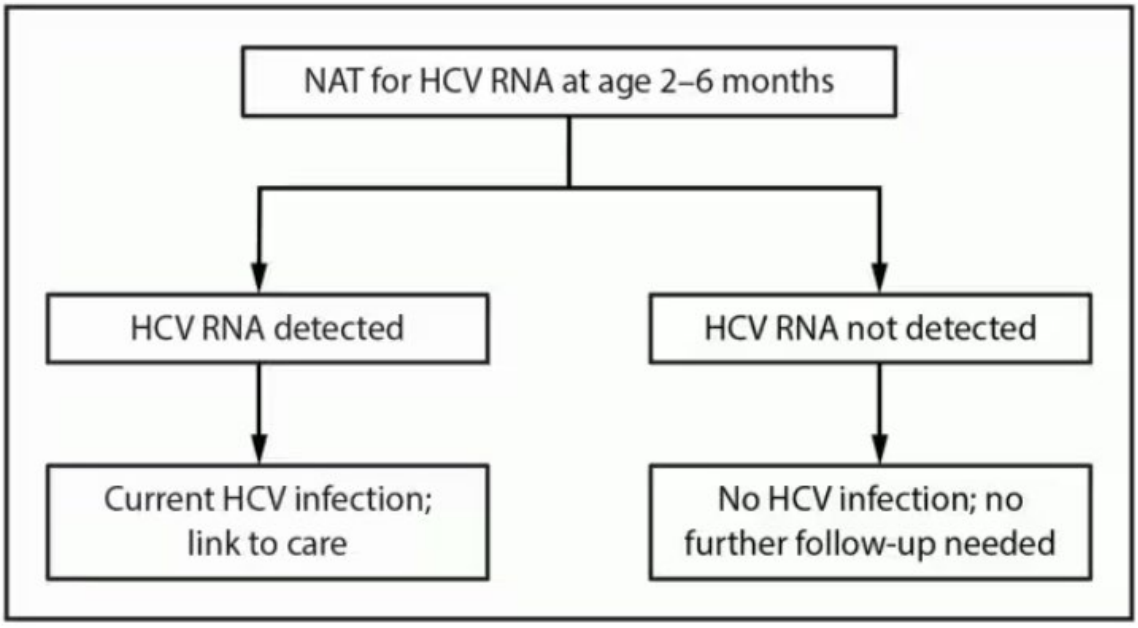
First step in case determination – Create a suspect case in MIDIS*	Evidence of perinatal exposure to HCV ☐ Known maternal HCV infection, HCV RNA positive ***OR*** ☐ New maternal HCV infection, confirmed, HCV RNA positive ***OR*** ☐ New maternal HCV infection, probable, HCV antibody positive ☐ Other (please specify): Action: Follow-up to determine that appropriate labs or ordered that would determine if this is a confirmed case.
Case determination – Not a case	☐ Negative or undetectable HCV RNA aged ≥ 2 months ***OR*** ☐ Negative or undetected HCV antibody aged ≥ 18 months ***OR*** ☐ Positive or detected HCV antibody AND a negative or undetected HCV RNA aged ≥ 18 months Action: Follow-up to ensure referrals are made to a provider with experience in treating infants/children with HCV infection *NOTE*: • A reactive antibody at age 18 months with an undetectable HCV RNA also might represent presence of maternal antibody. • If clinical symptoms, signs, or laboratory findings consistent with hepatitis C appear later in childhood, retesting is reasonable because rare false-negative test results and postnatal acquisition of the infection through other means are possible.
Case determination – Confirmed case	☐ HCV RNA positive test results for infants between 2 to 36 months of age; ***OR*** ☐ HCV genotype test results for infants between 2 to 36 months of age or greater; ***OR*** ☐ HCV antigen test results for infants between 2 to 36 months of age or greater. ***AND*** ☐ Not known to have been exposed to HCV via mechanism other than perinatal. Action: Follow-up to ensure referrals are made to a provider with experience in treating infants/children with HCV infection

Suspect cases are not reported to CDC.

Treatment for Perinatally Acquired Chronic Hepatitis C

- Standard practice calls for infants and children with perinatally acquired HCV infection (detectable HCV RNA at or after age two months) to be managed in consultation with a provider with expertise in pediatric hepatitis C management to receive related screenings, preventive services, interventions, and regular follow-up.
- Children who test positive should be retested with a NAT for HCV RNA before beginning treatment, which can be started as early as age three years (detailed management guidelines are available at from Infectious Diseases Society of America and American Association of Study of Liver Diseases).

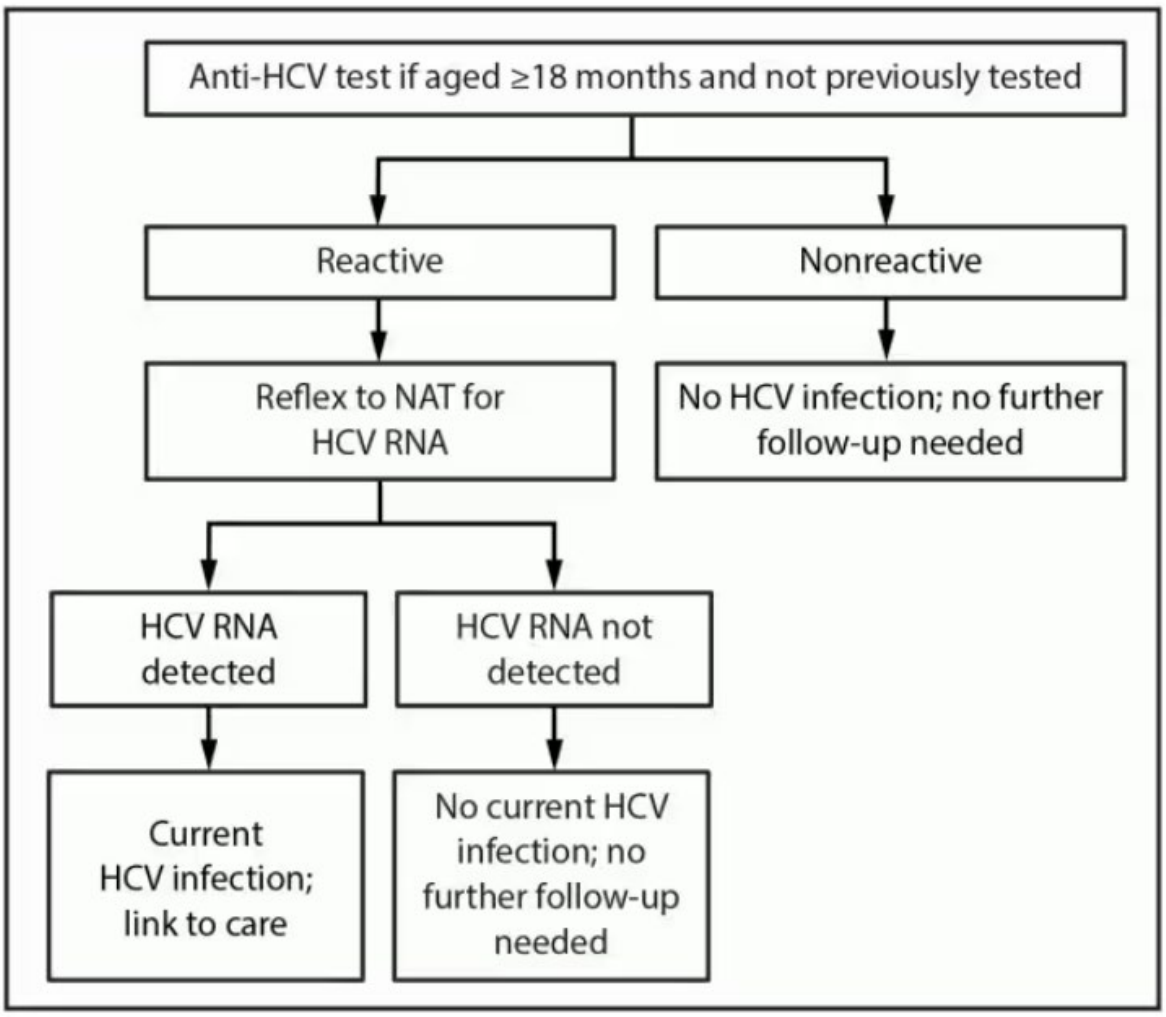
Figure 8: Algorithm for Hepatitis C Virus Testing of Perinatally Exposed Children — United States, 2023*



*Perinatally exposed children aged 7–17 months who have not previously been tested also should receive a NAT for HCV RNA.

† No further follow-up needed after a negative HCV RNA performed at age two to six months unless clinically warranted (i.e., clinical symptoms or signs or laboratory findings consistent with hepatitis C).

Figure 9: Algorithm for Hepatitis C Virus Testing of Perinatally Exposed Children Aged ≥18 Months Who Have Not Previously Been Tested† — United States, 2023*



* Perinatally exposed children are children born to pregnant women with HCV infection.

† Not tested for perinatal HCV transmission with a NAT for HCV RNA at age 2–17 months.

Source: CDC Recommendations for Hepatitis C Testing Among Perinatally Exposed Infants and Children — United States, 2023

Hepatitis C Perinatal Case Classification

2018 Case Definition

Clinical Criteria

Perinatal hepatitis C in pediatric patients may range from asymptomatic to fulminant hepatitis.

Laboratory Criteria

HCV RNA positive test results for infants between 2 to 36 months of age; OR
HCV genotype test results for infants between 2 to 36 months of age or greater; OR
HCV antigen test results for infants between 2 to 36 months of age or greater.

Epidemiologic Linkage

Maternal infection with HCV of any duration, if known. Not known to have been exposed to HCV via a mechanism other than perinatal (e.g. not acquired via healthcare).

Criteria to Distinguish a New Case from an Existing Case

Test results prior to two months of age should not be used for classification. Test results after 36 months of age should be reported under the 2015 Acute and Chronic HCV Infection case classification and not as perinatal HCV infection. Event date should be based on earliest relevant laboratory test date within the 2–36 month window.

Confirmed Case Classification

- Infant who has a positive test for HCV RNA nucleic acid amplification test (NAAT) at ≥2 months and ≤36 months of age *OR,*
- HCV antigen at ≥2 months and ≤36 months of age *OR*,
- Detectable HCV genotype at ≥2 months and ≤36 months of age *AND*
- Is not known to have been exposed to HCV via a mechanism other than perinatal.

Reporting

Cases of perinatal hepatitis C should be reported to the DPHHS Communicable Disease and Epidemiology section or local health department in accordance with requirements for reporting HCV infections (ARMS 37.114.203). Case definitions for reportable cases have been published by the Council of State and Territorial Epidemiologists

Reporting forms can be found here: CDEpi Section Resources (mt.gov)

Breastfeeding

According to CDC, there is no documented evidence that breastfeeding spreads HCV. Therefore, having HCV-infection is not a contraindication to breastfeeding (CDC Recommendations for Hepatitis C Testing Among Perinatally Exposed Infants and Children, 2023).

However, data are insufficient to definitively establish the safety of an HCV-positive mother breastfeeding if her nipples are cracked or bleeding. However, HCV is spread by infected blood. Therefore, if the HCV-positive mother's nipples and/or surrounding areola are cracked and bleeding, they should stop nursing temporarily. To maintain milk supply while not breastfeeding, breast milk can be expressed and discarded until the nipples are healed. Once the nipples are no longer cracked or bleeding, the HCV-positive mother may fully resume breastfeeding.

Exclusion from School or Daycare

It is not recommended that children with HCV be excluded due to the negligible transmission risk and research showing no documented cases of transmission in the childcare settings. Collins et al, 2018) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7152033/ [ncbi.nlm.nih.gov].

Children with HCV infection can participate in all normal childhood activities and should not be excluded from childcare centers or schools. However, because it can be spread through contact with blood, parents of children with HCV infection should make sure household items such as toothbrushes, razors, nail clippers, or other items that may contain small amounts of blood, are not shared.

Other considerations may include:

- Follow standard precautions and make sure that proper hand washing and diaper changing practices are followed.
- Clean up blood spills immediately.
- Wear gloves when cleaning up blood spills or providing first aid for bleeding wounds. Wash your hands afterwards.
- Weari gloves when changing a diaper soiled with bloody stools. Wash your hands afterwards. If you have open sores or rash, cuts or other abrasions on the hands, wear gloves for changing diapers.
- Disinfect diaper-changing areas and surfaces on which blood has been spilled using a freshly-prepared bleach solution.
- Place disposable items contaminated with blood or bodily fluids in sealed plastic bags in covered trash containers. Put other items contaminated with blood or body fluid in sealed plastic bags.

Public Health Worksheet: HCV Perinatal Follow-Up and Determination Tool

Investigator (PHN/DIS): _____

Jurisdiction: _____ Date: _____

Maternal information	
MIDIS ID	
Name	
DOB:	
Phone	
Maternal Provider Name	
Maternal Provider Phone	

Infant			
MIDIS ID		DOB	
Name			
Caregiver Name		Caregiver Number	
Infant Provider Name		Provider Number	

Laboratory test(s) - Infant	Child's Age	Date	Result
HCV antibody test (anti-HCV)			
HCV RNA test (NAT)			
Other: (please specify)			
Other:			
Other:			
Other:			
Other:			

Reason for testing for infant	Notes
Evidence of perinatal exposure to HCV	Date exposed (if known): Notes:
A mother with documented HCV infection	☐ Probable ☐ Confirmed Date diagnosed (if known):
A confirmed positive test for HCV antibody and a mother whose infection status is unknown or undocumented (probable case)	Date diagnosed (if known):
A confirmed positive RNA test and a mother whose infection status is unknown or undocumented (confirmed case)	Date diagnosed (if known):
Other (please specify)	

Maternal History		
Known diagnosis of HCV	☐ Probable ☐ Confirmed ☐ Unknown Date diagnosed (if known):	
New diagnosis of HCV	☐ Probable ☐ Confirmed ☐ Unknown Date diagnosed (if known):	
Value of last viral load (if known)	Date:	Result:

Infant follow-Up			
Antibody Testing (Recommended *only* age >18 months)	☐ Yes ☐ Unknown Age of child:	Date:	Result:
HCV RNA Testing (Recommended age 2-6 months)	☐ Yes ☐ Unknown Age of child:	Date:	Result:
HCV RNA Testing (Recommended age 7-17 months if not previously tested)	☐ Yes ☐ Unknown Age of child:	Date:	Result:
First step in case determination – Create a suspect case in MIDIS*	Evidence of perinatal exposure to HCV ☐ Known maternal HCV infection, HCV RNA + ☐ New maternal HCV infection, confirmed, HCV RNA + ☐ New maternal HCV infection, probable, HCV antibody + ☐ Other (please specify): Action: Follow-up to determine that appropriate labs or ordered that would determine if this is a confirmed case.		
Case determination – Not a case	☐ Negative or undetectable HCV RNA aged ≥ 2 months OR ☐ Negative or undetected HCV antibody aged ≥ 18 months OR ☐ Positive or detected HCV antibody AND a negative or undetected HCV RNA aged ≥ 18 months Action: No follow-up required		
Case determination – Confirmed case	☐ HCV RNA positive test results for infants between 2 to 36 months of age; OR ☐ HCV genotype test results for infants between 2 to 36 months of age or greater; OR ☐ HCV antigen test results for infants between 2 to 36 months of age or greater Action: Follow-up to ensure referrals are made to a provider with experience in treating infants/children with HCV infection		
Referrals (please specify):			

Questions? Contact the Communicable Disease and Epidemiology (CDEpi) section 406-444-0273.

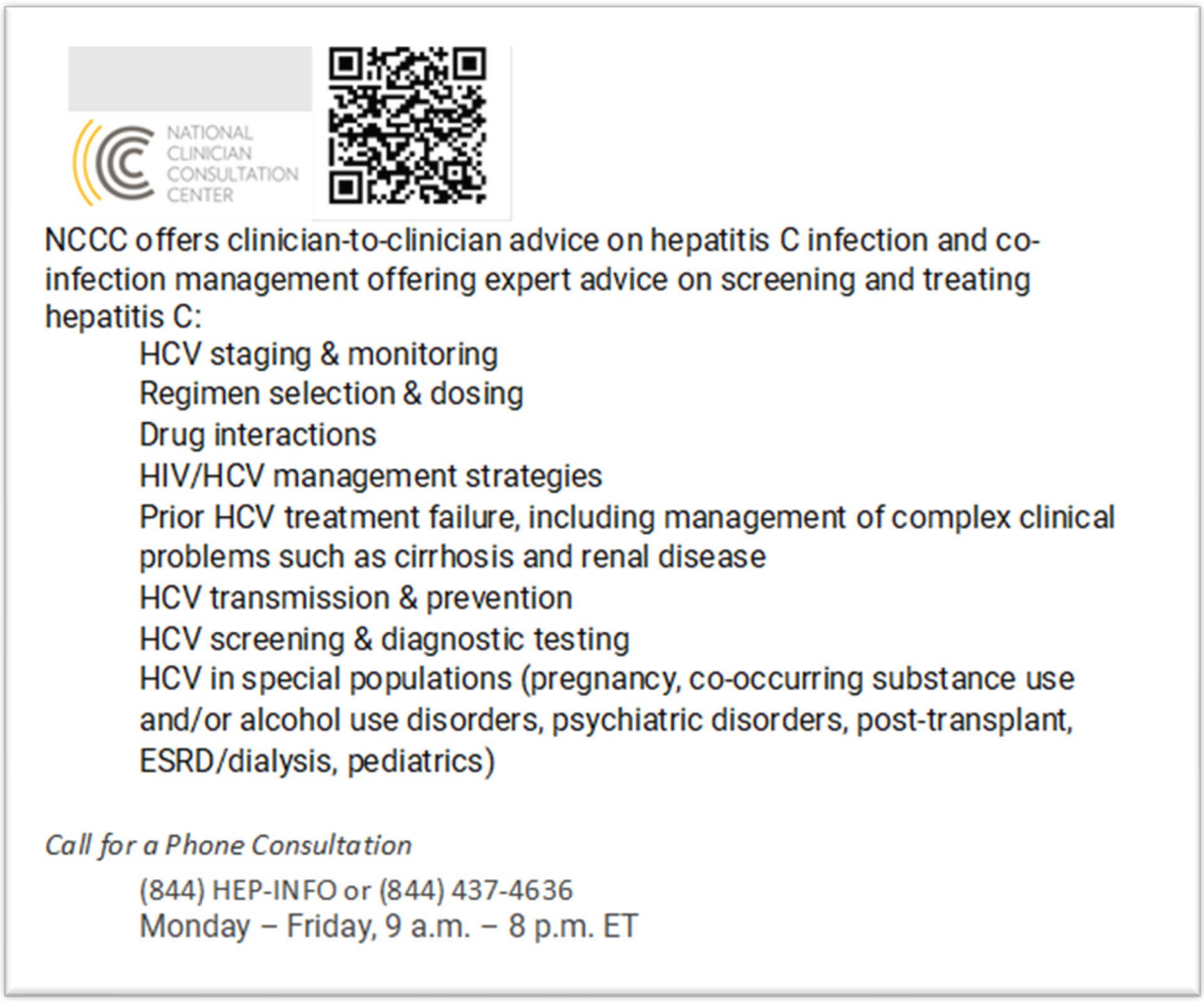
Resources

Major Guidelines

- CDC Recommendations for Hepatitis C Testing Among Perinatally Exposed Infants and Children — United States, 2023
- CDC Recommendations for Hepatitis C Screening Among Adults — United States, 2020
- Testing and Clinical Management of Health Care Personnel Potentially Exposed to Hepatitis C Virus — CDC Guidance, United States, 2020
  MMWR 2020; 69(RR-6):1–8

Questions and answers for the public: Hepatitis C Basics | Hepatitis C | CDC

Questions and answers for health professionals: CDC Recommendations for Hepatitis C Testing Among Perinatally Exposed Infants and Children — United States, 2023 | MMWR



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Huang QT, Hang LL, Zhong M, Gao YF, Luo ML, Yu YH. Maternal HCV infection is associated with intrauterine fetal growth disturbance: a meta-analysis of observational studies. Medicine (Baltimore) 2016;95:e4777.

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CDC. Hepatitis C, perinatal infection 2018 case definition. Atlanta, GA: US Department of Health and Human Services, CDC; 2022. https://ndc.services.cdc.gov/case-definitions/hepatitis-c-perinatal-infection-2018

Mast EE, Hwang LY, Seto DS, et al. Risk factors for perinatal transmission of hepatitis C virus (HCV) and the natural history of HCV infection acquired in infancy. J Infect Dis 2005;192:1880–9.

Ades AE, Gordon F, Scott K, et al. Spontaneous clearance of vertically acquired hepatitis C infection: implications for testing and treatment. Clin Infect Dis 2023;76:913–91.

Human Immunodeficiency Virus (HIV)

Contact: MT DPHHS Communicable Disease and Epidemiology (CDEpi) section
406-444-0273

Background

Perinatal, or mother-to-child HIV transmission happens when a pregnant woman living with HIV passes HIV to their baby. It can happen during pregnancy, delivery, and through breastfeeding. Transmission risk increases among women who have not had prenatal care, were not tested, or were tested late in pregnancy.

Advances in HIV research, prevention, and treatment have made it possible for people with HIV to give birth to babies who are free of HIV. Combined antiretroviral therapy can achieve a risk of 1–2% or less for maternal-to-child transmission if maternal viral loads of 1,000 copies/mL or less can be sustained, independent of the route of delivery or duration or ruptured membranes before delivery. The annual number of diagnoses of perinatal HIV infections in the United States and territories has declined by more than 95% since the early 1990s.

The Department of Public Health and Human Services (DPHHS) provides guidelines for testing and treating HIV-infected pregnant women and their infants with the aim of preventing transmission during conception, pregnancy, labor and delivery, and the post-partum period.

The *Panel on Treatment of Pregnant Women with HIV Infection and Prevention of Perinatal Transmission* provides guidance to HIV care practitioners in the United States on the optimal use of antiretroviral (ARV) agents to treat HIV infection in pregnant people and to prevent perinatal HIV transmission in HIV-exposed infants. Because of the complexity and evolution of HIV during pregnancy, and the use of ARV drugs to prevent perinatal (vertical) HIV transmission (i.e., during pregnancy and labor and delivery) and postnatal HIV transmission (i.e., through breastfeeding), please refer to this guidance for the most up-to-date clinical recommendations.

Recommendations for Screening of Pregnant Women

HIV testing is recommended for:

- All sexually active people and should be a routine component of pre-pregnancy care.
- All pregnant women should receive opt-out HIV testing as early as possible during each pregnancy (see 2018 Quick Reference Guide: Recommended Laboratory HIV Testing Algorithm CDC or Figure 10).

Repeat HIV testing is recommended for:

- Pregnant women with negative initial HIV tests who are at increased risk of acquiring HIV.
- Pregnant women with a sexually transmitted infection, with signs and symptoms of acute HIV infection, or with ongoing exposure to HIV. Initiation of pre-exposure prophylaxis (PrEP) is recommended if HIV testing is negative and there is ongoing exposure to HIV. See Pre-Exposure Prophylaxis (PrEP) to Prevent HIV During Periconception, Antepartum, and Postpartum Periods for more information.

For clinical management of a pregnant woman with HIV, practicing providers may contact the **National Clinician Consultation Center** for rapid perinatal HIV consultation. Topics include:

- HIV testing in pregnancy
- Treating pregnant women with HIV
- Preventing transmission during labor and delivery and the post-partum period
- HIV-exposed infant care
- Infant feeding

Contact: 888-448-8765,
24 hours, seven days a week.

HIV testing should be performed during labor or after delivery for:

- Women with undocumented HIV status.
- Women who tested negative early in pregnancy but are at increased risk of acquiring HIV infection and who were not retested in the third trimester.

Considerations for HIV Testing

HIV antigen/antibody testing should be available 24 hours a day, and results should be available within one hour. If results of expedited HIV testing are positive, treatment should be initiated immediately (see Recommendations for the Use of Antiretroviral Drugs During Pregnancy and Interventions to Reduce Perinatal HIV Transmission in the United States). HIV test results of the birthing woman should be documented in the newborn's medical record and communicated to the newborn's primary care provider.

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.

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 woman. 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 (see Diagnosis of HIV Infection in Infants and Children for additional information).

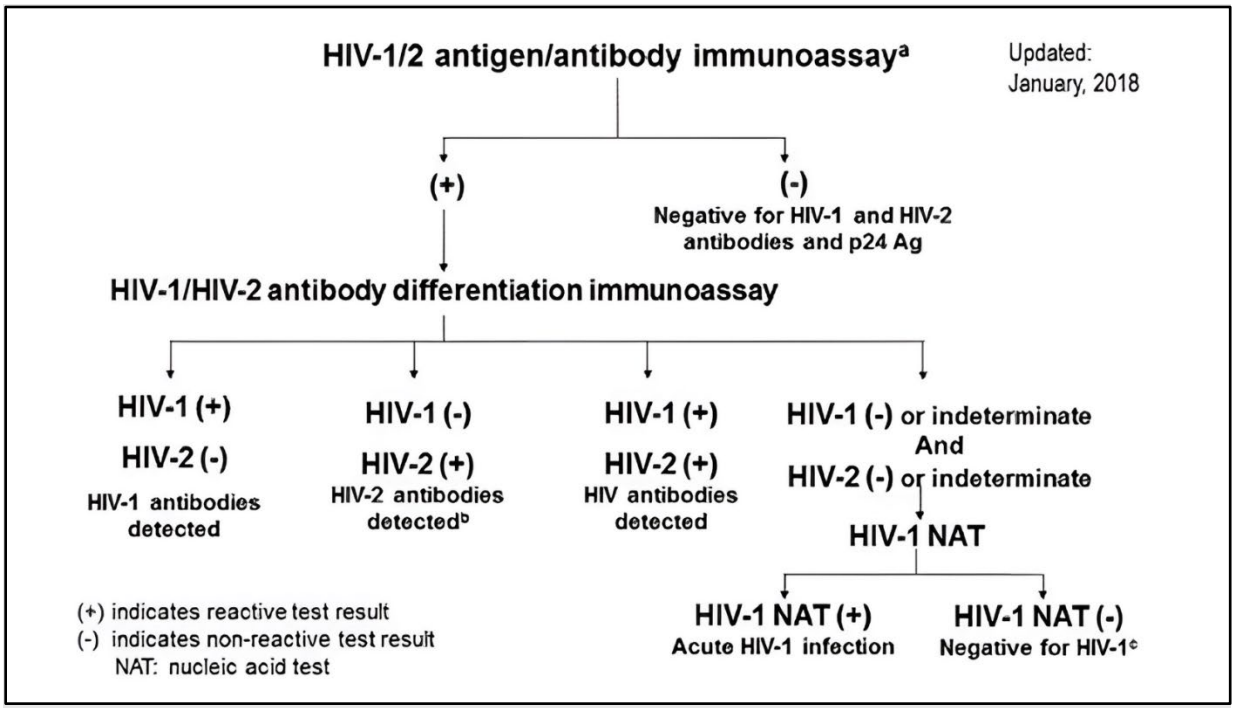
If HIV test results of the birthing woman are unavailable at birth, the newborn should be tested using an expedited antibody test to identify perinatal HIV exposure. If positive, an HIV NAT should be performed on the infant, and the birthing parent should be offered standard HIV diagnostic testing as soon as possible. In this situation, presumptive HIV therapy appropriate for infants who are at high risk of perinatal HIV transmission should be initiated immediately (See Antiretroviral Management of Newborns with Perinatal HIV Exposure or HIV Infection).

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

- HIV RNA or HIV DNA nucleic acid tests diagnostic testing is recommended for all infants with perinatal HIV exposure at the following ages:
    - 14 to 21 days
    - 1 to 2 months
    - 4 to 6 months

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

Figure 10: Recommended Laboratory HIV Testing for Serum or Plasma Specimens



For more information:

- 2018 Quick reference guide: Recommended laboratory HIV testing algorithm for serum or plasma specimens (cdc.gov)

HIV Case Classification

HIV Case Classification

Children Aged <18 Months Born to Mothers Who Have an Unknown Infection Status or Were Known to be Infected

Laboratory Evidence

A child aged <18 months is categorized for surveillance purposes as HIV infected if all the following criteria are met:

- Positive results on at least one specimen (not including cord blood) from any of following HIV virologic tests:
    - HIV-1 NAT (DNA or RNA) **OR**
    - HIV-1 p24 antigen test, including neutralization assay for a child aged >1 month.
    - HIV isolation (viral culture) **OR**
    - HIV nucleotide sequence (genotype).
- The test date (at least the month and year) is known.
- One or both of the following:
    - Confirmation of the first positive result by another positive result on one of the above virologic tests from a specimen obtained on a different date **OR**
    - No subsequent negative result on an HIV antibody test, and no subsequent negative result on an HIV NAT before age 18 months.

Clinical Evidence

- The same criteria as in the laboratory evidence **OR**
- All three of the following alternative criteria:
    - Evidence of perinatal exposure to HIV infection before age 18 months **AND**
    - A mother with documented HIV infection **AND**
    - A confirmed positive test for HIV antibody (e.g., a positive initial antibody test or antigen/antibody test, confirmed by a supplemental antibody test) and a mother whose infection status is unknown or undocumented.
    - Diagnosis of an opportunistic illness indicative of stage 3 disease or AIDS (Figure 11).
    - No subsequent negative result on an HIV antibody test.

To avoid unnecessary complexity for surveillance, the HIV case classification does not make a distinction between definitive and presumptive diagnoses of HIV infection in children aged <18 months.

Figure 11 Stage-3-Defining Opportunistic Illnesses in HIV Infection

- Bacterial infections, multiple or recurrent*
- Candidiasis of bronchi, trachea, or lungs
- Candidiasis of esophagus
- Cervical cancer, invasive†
- Coccidioidomycosis, disseminated or extrapulmonary
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis, chronic intestinal (>1 month's duration)
- Cytomegalovirus disease (other than liver, spleen, or nodes), onset at age >1 month
- Cytomegalovirus retinitis (with loss of vision)
- Encephalopathy attributed to HIV§
- Herpes simplex: chronic ulcers (>1 month's duration) or bronchitis, pneumonitis, or esophagitis (onset at age >1 month)
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (>1 month's duration)
- Kaposi sarcoma
- Lymphoma, Burkitt (or equivalent term)
- Lymphoma, immunoblastic (or equivalent term)
- Lymphoma, primary, of brain
- Mycobacterium avium complex or Mycobacterium kansasii, disseminated or extrapulmonary
- Mycobacterium tuberculosis of any site, pulmonary†, disseminated, or extrapulmonary
- Mycobacterium, other species or unidentified species, disseminated or extrapulmonary
- Pneumocystis jirovecii (previously known as "Pneumocystis carinii") pneumonia
- Pneumonia, recurrent†
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia, recurrent
- Toxoplasmosis of brain, onset at age >1 month
- Wasting syndrome attributed to HIV§

* Only among children aged <6 years.
† Only among adults, adolescents, and children aged ≥6 years.
§ Suggested diagnostic criteria for these illnesses, which might be particularly important for HIV encephalopathy and HIV wasting syndrome, are described in the following references:

CDC. 1994 Revised classification system for human immunodeficiency virus infection in children less than 13 years of age. MMWR 1994;43(No. RR-12).
CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992;41(No. RR-17).

Reporting

Local and tribal public health departments are alerted of all positive HIV labs in accordance with requirements for reporting HIV infections (ARMS 37.114.203).

The reporting form can be found here: CDEpi Section Resources (mt.gov)

Breastfeeding

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. Individuals with HIV who have been on ART with a sustained undetectable viral load and who choose to breastfeed should be supported in this decision.

For infants with perinatal HIV exposure who are being breastfed, virologic diagnostic testing is recommended at birth, 14 to 21 days, 1 to 2 months, and 4 to 6 months of age. An additional virologic test should be performed between the 1-to-2-month and 4-to-6-month time points if the gap between tests is greater than three months. See Infant Feeding for Individuals With HIV in the United States.

Exclusion from School or Daycare

Infants who have been exposed to HIV or have with HIV infection should not be excluded from childcare. There is no obligation to notify daycare personnel of an infant's exposure or HIV infection status. HIV is not spread through the type of contact that occurs in childcare settings such as touching, hugging, playing, feeding or by contact with surfaces touched by infected people. It is not spread by saliva, tears, stool (bowel movements), urine or kissing.

However, because it can be spread through contact with blood, parents of children with HIV infection should make sure household items such as toothbrushes, razors, nail clippers, or other items that may contain small amounts of blood, are not shared.

Other considerations may include:

- Follow standard precautions and make sure that proper hand washing and diaper changing practices are followed.
- Clean up blood spills immediately. Wear gloves when cleaning up blood spills or providing first aid for bleeding wounds. Wash your hands afterwards.
- Wear gloves when changing a diaper soiled with bloody stools. Wash your hands afterwards. If you have open sores or rash, cuts, or other abrasions on the hands, wear gloves for changing diapers.
- Disinfect diaper-changing areas and surfaces on which blood has been spilled. Use freshly prepared bleach solution.
- Place disposable items contaminated with blood or bodily fluids in sealed plastic bags in covered trash containers. Put other items contaminated with blood or body fluid in sealed plastic bags.

Public Health Follow-Up

Pediatric lab results require specific follow-up. The following tool may assist in the investigation and case ascertainment. A modifiable Microsoft Word document can be found here. If there is perinatal exposure, CDEpi will work with LHJ to initiate an HIV investigation as a 'Suspect' case in MIDIS. The case will be closed once follow-up testing is completed and case status is either 'Not a Case' or 'Confirmed'.

Public Health Worksheet – HIV Perinatal Follow-Up and Determination Tool

Investigator (PHN/DIS): _____

Jurisdiction: _____ Date: _____

Maternal information	
MIDIS ID	
Name	
DOB:	
Phone	
Maternal Provider Name	
Maternal Provider Phone	

Infant			
MIDIS ID		DOB	
Name			
Caregiver Name		Caregiver Number	
Infant Provider Name		Provider Number	

Laboratory test(s) - Infant	Date	Results
HIV-1 p24 antigen test		
HIV-1 NAT (DNA or RNA)		
HIV isolation (viral culture)		
HIV nucleotide sequence (genotype)		
Other (please specify)		
Other		
Other		

Reason for testing for infant	Notes
Evidence of perinatal exposure to HIV infection before age 18 months	
A mother with documented HIV infection	
A confirmed positive test for HIV antibody and a mother whose infection status is unknown or undocumented	
Diagnosis of an opportunistic illness indicative of stage-3-HIV (AIDS)	
Doctor diagnosis (please indicate date)	
Other (please specify)	

Maternal History		
Known diagnosis of HIV	☐ Yes ☐ No NOTES:	Date diagnosed:
New diagnosis of HIV	☐ Yes ☐ No NOTES:	Date diagnosed:

Maternal History Continued		
Documented history of ARV use during pregnancy	☐ Yes ☐ No NOTES:	
Value of last viral load (if known)		Date:
Result of last CD4 (if known)		Date:
Plans for breastfeeding	☐ Yes ☐ No ☐ Unknown	

Infant follow-Up*		
Testing (14 to 21 days)	☐ Yes ☐ No ☐ Unknown	Date: Result:
Testing (1 to 2 months)	☐ Yes ☐ No ☐ Unknown	Date: Result:
Testing (4 to 6 months)	☐ Yes ☐ No ☐ Unknown	Date: Result:
Anti-retroviral use	☐ Yes ☐ No ☐ Unknown	Date begun:
Case determination	☐ Suspect case ☐ Not a case (negative RNA lab ≥ 6 months age) ☐ Confirmed case	
Referrals (please specify)		

***If breastfed, please consult with infant feeding guidance as follow-up testing may differ.**

Questions? Contact the Communicable Disease and Epidemiology (CDEpi) section 406-444-0273.

Resources

The NCCC is a member of the HRSA AIDS Education and Training Centers (AETC) Program, which provides training, continuing education, resources, and learning opportunities free of charge for healthcare providers on HIV and related topics. The AETC program supports a network of eight regional centers and more than 130 local performance sites. More information is available on our Clinical Training page.

HIV Care Tools

The new AETC Program app supports health care providers with point-of-care tools for HIV screening, prevention, and care. Take us with you!

Available at the App Store

Or at Google Play

Sign up: Perinatal ReproID HIV Listserv

The **NCCC Perinatal ReproID HIV Listserv** is a forum to connect with providers, discuss difficult perinatal HIV cases, and share tools and protocols. Contact the National Clinician Consultation Center to join: Hoa.Su@ucsf.edu

References

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