

REDUCING VERTICAL HIV TRANSMISSION IN NEW JERSEY

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Case Report: *Sunanda Gaur, MD, et al*

LEARNING OBJECTIVES:

Upon completion of this learning activity, the reader should be able to:

- 1. Explain the rationale for pre-conceptual counseling of women with HIV infection.*
- 2. Understand the role of short course antiretroviral therapy in reducing the risk of perinatal HIV transmission.*
- 3. Describe the role of HIV counseling and rapid HIV testing for women who present in labor with unknown HIV status.*
- 4. Summarize new guidelines for HIV counseling and testing in pregnancy.*



Introduction

Reducing the risk of vertical HIV transmission has been a successful public health intervention in New Jersey. New Jersey has a high prevalence of HIV disease. Through December 31, 2005, 32,885 persons were living with HIV disease in the state. New Jersey ranks fifth in the country in cumulative reported AIDS cases, and third in the country in cumulative reported pediatric AIDS cases. Of 1,315 pediatric HIV/AIDS cases in New Jersey, 1,229 (93%) are a result of perinatal transmission. The number of infants born with HIV infection each year has dropped from 91 in 1993 to 6 in 2005.¹ This is an indication of the effectiveness of intervention during pregnancy, labor and delivery.

The risk of vertical HIV transmission with no antiretroviral treatment is 25%.² With counseling and testing and highly active antiretroviral therapy starting in the second trimester, the risk of transmission can be reduced to 1%-2%.³

This paper describes the epidemiology of mother-to-child HIV transmission in New Jersey, HIV counseling, and medical management of HIV infected pregnant women. It also explains the rationale for repeat HIV testing in the third trimester, which is recommended by NJDHSS (New Jersey Department of Health and Senior Services) and ACOG (American College of Obstetricians and Gynecologists), and is part of the 2006 CDC recommendations for increasing HIV testing in pregnancy for all women in high-prevalence areas including New Jersey.²

Faculty:

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Epidemiology of Vertical HIV Transmission in New Jersey

Perinatal exposure to HIV disease and cases of pediatric HIV/AIDS are required by law to be reported to the New Jersey Department of Health and Senior Services (NJDHSS), Division of HIV/AIDS Services (DHAS). NJDHSS, DHAS extensively evaluates all facets of prevention efforts to reduce the risk of mother-to-child HIV transmission. These evaluations indicate that over 90% of providers offer HIV testing; over 90% of patients accept testing, 91% of patients are diagnosed prior to labor and 4% are diagnosed at labor and delivery. Twenty to 25% of HIV-infected pregnant women do not receive prenatal care or have two or fewer prenatal visits. If the mother's HIV status is not documented on the medical record available in the labor and delivery area, the delivery team will not know the mother's HIV status and will not know to provide antiretroviral agents to the mother and the newborn. Antiretroviral use in pregnancy and labor and delivery has increased from 8.3% in 1993 to 91% in 2004. As the use of antiretroviral agents increased, the perinatal transmission rate in New Jersey has decreased from 21% in 1991 to 2% in 2004.¹

The major missed opportunity in the maximal reduction of vertical HIV transmission in New Jersey is women who present in labor with the delivery team unaware of their HIV status. In New Jersey, regulations require that all pregnant women receive counseling and be offered a voluntary HIV test.⁴ Ideally, all pregnant women should be offered HIV testing during an initial prenatal visit to allow for timely initiation of treatment to reduce the chance of vertical transmission. However, a particular area of concern is women who present in labor with unknown HIV status, that is, the HIV test results are not documented on the medical record. These women may not have been offered HIV counseling and testing during pregnancy, may have opted not to have an HIV test during pregnancy, or may not have received prenatal care. Clinical trial data have shown that antiretroviral medications, even when started during labor and delivery and continued in the neonatal period, can reduce mother-to-child HIV transmission by up to fifty percent compared to the risk if no antiretroviral is given.^{3,5,6}

Preconception Counseling

The U.S. Public Health Service Perinatal Working Group Guidelines contain a section on preconception counseling of women with HIV infection. Many women with HIV infection know their diagnosis at the time they become pregnant, and are often already on antiretroviral therapy. The guidelines recommend that, where desired, a woman be offered an effective method of contraception until she reaches an optimal health status for pregnancy. Prior to pregnancy, she should receive education and counseling about the risks of perinatal transmission, strategies to reduce those risks, and the potential effects of HIV and its treatment on the pregnancy, including the role of antiretroviral therapy in maximally reducing viral load and optimizing immune function. Initiation or modification of her antiretroviral therapy prior to conception can avoid agents with potential toxicity for the fetus (such as efavirenz or hydroxyurea) while choosing agents effective in reducing transmission and achieving a stable, maximally suppressed maternal viral load. Preconception counseling also provides the

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CONTINUING EDUCATION INFORMATION

Target Audience:

This activity is designed for physicians and nurses, and for other health care professionals in New Jersey who are involved in the care of women and infants, and persons with HIV/AIDS.

Statement of Need

On September 22, 2006, the CDC issued Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings. <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5514a1.htm>. The goal of this paper is to explain the rationale for expanded perinatal HIV testing including re-testing in the third trimester, based on the epidemiology of mother-to-child HIV transmission in New Jersey, and the established best practices of HIV counseling and medical management of HIV infected pregnant women.

Method of Instruction

Participants should read the learning objectives and review the activity in its entirety. After reviewing the material, complete the self-assessment test consisting of a series of multiple-choice questions.

Upon completing this activity as designed and achieving a passing score of 70% or more on the self-assessment test, participants will receive a credit letter and the test answer key four

(4) weeks after receipt of the self-assessment test, registration, and evaluation materials. Estimated time to complete this activity as designed is 1 hour.

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Review: This activity was reviewed for relevance, accuracy of content, balance of presentation, and time required for partici-

pation by Patricia Kloser, MD, MPH, and pilot-tested for time required for participation by Bonnie Abedini, BSN, MS; Mary C. Krug, RN, MSN, APN-C; and Debbie Y. Mohammed, MS, APRN-BC, ACRN.

Faculty Disclosure Declarations

Patricia Kloser, MD, MPH: Speaker's Bureau: GlaxoSmithKline, Roche; Consultant: Gilead, Boehringer Ingelheim. The following have no financial relationships to disclose: Sindy M. Paul, MD, MPH, Linda Dimasi, MPA, Helene Cross, PhD, Rose Marie Martin, MPH, Carolyn Burr, EdD, RN, Elaine Gross, RN, MS, Sunanda Gaur, MD, Manuel Jimenez, MD, Anna Petrova, MD, PhD, and Roseann Marone, RN, BSN, MPH; Bonnie Abedini, BSN, MS, Mary C. Krug, RN, MSN, APN-C, and Debbie Y. Mohammed, MS, APRN-BC, ACRN; New Jersey AIDSLine editor Kimi Nakata, MSW, MPH.

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opportunity to evaluate the woman's overall health including her risk for opportunistic infections and any needed prophylaxis, her nutritional status, screening for maternal psychological or substance abuse problems. The standard preconception evaluation should also be offered. She should be specifically counseled about assistive reproductive technologies that both prevent HIV exposure of an uninfected partner and protect her against reinfection with resistant or more virulent strains of HIV.³

HIV Counseling and Testing for Pregnant Women

The US Public Health Service, Centers for Disease Control and Prevention, (CDC) the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) and most recently, the U.S. Preventive Services Task Force recommend screening for HIV infection for all pregnant women.⁷⁻⁹ In New Jersey, HIV counseling is mandated with voluntary testing for all pregnant women. (Chapter 174, P.L. 1995). In addition, because of the high HIV prevalence in women of childbearing age in New Jersey, repeat HIV testing for pregnant women in the third trimester is also recommended by CDC, NJDHSS, and ACOG.^{2,10}

The majority of pregnant women choose to have an HIV test when their provider strongly recommends testing.¹¹ The best approach is to say in a respectful, matter-of-fact, and non judgmental manner: "I recommend that all my patients have an HIV test because it is important for their health and for their babies." A provider should explore a woman's reasons for declining testing and offer it again, particularly before 36 weeks gestation.

Providing HIV Results/ Post-Test Counseling

Results should always be given in person. HIV test results, whether negative or positive, should be clearly documented in the patient's chart and in the summary sent to the delivery hospital.

If the HIV screening test is negative, a woman can be informed simply that her HIV test was negative; she does not have HIV, but the test may not show recent infection. All women

should be advised about retesting in the third trimester (before the 36th week). Women with known risk factors can be offered/referred for risk-reduction counseling.

If the HIV test is positive, counseling a pregnant woman with a positive HIV test is stressful for both the patient and the provider. A woman should be informed that her HIV test was positive, which means she has HIV infection, even though she may feel well and have no symptoms. The discussion should emphasize that treatment is available for her own health and to reduce the risk of transmission to her baby. Linking the woman to HIV clinical care, counseling, support, and prevention services is of primary importance. The clinician should inform the woman that positive HIV results are reportable in New Jersey and will be shared with the physician caring for her infant, stressing that this information is otherwise kept confidential.

Antiretroviral Drugs

The Guidelines also update recommendations for the use of antiretroviral (ARV) drugs to reduce perinatal HIV transmission. The guidelines recommend that the 3-part zidovudine (ZDV) regimen, alone or in combination with other antiretroviral agents, should be discussed with and offered to all pregnant women with HIV infection beginning after the first trimester. The 3-part ZDV regimen is provided in Table 1.

Since a lower viral load is associated with a reduced risk of perinatal HIV transmission, the combination of ZDV with additional ARV drugs is the recommended treatment for infected women with an HIV RNA copy levels over 1,000 or whose clinical, virological, or immunological status requires it. Combination therapy should be considered for women with HIV RNA level less than 1000 copies. A woman with HIV who is already receiving ARV whose pregnancy is identified after the first trimester should continue treatment and ZDV should be a component of the treatment regimen whenever possible. ZDV is recommended during the intrapartum and newborn periods regardless of the mother's earlier treatment. The addition of other ARV drugs, such as nevirapine, at the time of delivery for women with less than optimal viral suppression has not been shown to provide additional protection against perinatal transmission and is not recommended by the Guidelines.³

Short course therapy for women in labor who have had no prior therapy is described in Table 2, Scenario 3, "Women in labor who have had no prior therapy." Infants born to mothers who have received no ARV during pregnancy or intrapartum should receive 6 weeks of neonatal ZDV initiated as soon as possible after delivery – preferably within 6-12 hours of birth. These four scenarios are described in more detail in Table 2

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Counseling about the HIV screening test does not need to be onerous, and should include the following information²:

- HIV is the virus that causes AIDS. It is transmitted through unprotected sex, or through sharing of needles through injection drug use.
- A pregnant woman who has HIV can pass the virus to her baby before or during birth or by breastfeeding.
- Women, especially, may not know they are at risk.
- HIV is treatable. Treatment can prolong a woman's life and prevent transmission to her baby during pregnancy and birth.
- Experts recommend that all pregnant women be tested for HIV.
- If a woman is HIV-positive, she can get treatment immediately. If she is HIV-negative, she can learn ways to prevent getting the infection in the future.
- A woman has the right to refuse testing and will not be denied care if she does so.

Using the New Jersey state consent or declination form for HIV testing in pregnancy is a simple way to document this content as well as the woman's decision.

(see page 6). A comparison of the intra-partum/post-partum regimens for women in labor who have not had prior ARV (Scenario 3) is provided in Table 3 (see page 7).³

The Guidelines recently updated the recommendation regarding resistance testing and now recommend resistance testing for all pregnant women not currently receiving antiretrovirals before the initiation of therapy for treatment or prophylaxis. Resistance testing is also recommended for pregnant women on ARVs who have virologic failure with detectable HIV RNA levels or who fail to reach optimal viral suppression. Intravenous ZDV during labor and for the newborn is still recommended for women with documented ZDV resistance or whose regimen does not include ZDV.

Women in Labor with Unknown HIV Status

Women who present in labor with unknown HIV status represent the major missed opportunity to the maximal reduction of vertical HIV transmission in New Jersey. The key to maximal perinatal HIV risk reduction for these women is rapid HIV testing and initiation of short course therapy. The CDC-sponsored Mother-Infant Rapid Intervention at Delivery (MIRIAD) study

showed that offering voluntary HIV testing during labor is feasible in obstetrical settings. In addition, point-of-care rapid HIV testing has been shown to provide results faster than sending specimens to the hospital laboratory for rapid HIV testing.¹² Rapid HIV testing is recommended for women in labor whose HIV status is unknown.¹³ The NJDHSS has established a standard of care in which women who present in labor with unknown HIV status should receive counseling, be offered voluntary rapid HIV testing, and, if a preliminary positive rapid HIV test result is obtained, be offered short course ARV therapy. Both mother and infant should be referred to physicians with experience and expertise treating HIV disease for follow-up care.¹⁴

Mode of Delivery

A significant number of newborns become infected during labor and delivery. Although the exact mechanism of transmission is unknown, it may occur through transplacental microtransfusion of blood during uterine contractions or by exposure to the virus in the cervicovaginal secretions during delivery.¹⁵ A cesarean delivery prior to the onset of labor and before the rupture of membranes reduces the risk of vertical HIV transmission

for women whose HIV RNA viral load exceeds 1,000 copies per milliliter. The American College of Obstetrics and Gynecology recommends a scheduled, elective caesarian section at 38 weeks of completed gestation for women whose viral load exceeds 1,000 copies per milliliter. Viral load monitoring is recommended every three months or following changes in ARV therapy. The most recent viral load results should be used to determine the mode of delivery. For women whose viral load is less than 1,000 copies per milliliter, the risk of cesarean delivery outweighs the potential benefits.¹⁷

Summary

Reduction of perinatal HIV transmission represents a major public health accomplishment in New Jersey. However, cases continue to occur. The risk of vertical HIV transmission can be reduced through universal HIV counseling in pregnancy, routine testing, ARV for women with HIV for their own health and to reduce the risk of perinatal transmission, and appropriate obstetrical care. Even if a woman initially presents in labor, the risk of vertical transmission can be significantly reduced through rapid HIV testing and short course ARV therapy.

TABLE 1. Pediatric AIDS Clinical Trials Group (PACTG) 076 Zidovudine (ZDV) Regimen³



Time of Zidovudine (ZDV) Administration	Regimen
Antepartum (Pregnancy)	Oral administration of 100 mg ZDV five times daily, initiated at 14 to 34 weeks' gestation and continued throughout the pregnancy Note: Oral ZDV administered as 200 mg three times daily or 300 mg twice daily is currently used in general clinical practice and is an acceptable alternative regimen to 100 mg orally five times daily.
Intrapartum (Labor and Delivery)	During labor, intravenous administration of ZDV in a one-hour initial dose of 2 mg/kg body weight, followed by a continuous infusion of 1 mg/kg body weight/hour until delivery.
Postpartum (After Birth)	Oral administration of ZDV to the newborn (ZDV syrup at 2 mg/kg body weight/dose every 6 hours) for the first 6 weeks of life, beginning at 8 to 12 hours after birth. Note: Intravenous dosage for full-term infants who cannot tolerate oral intake is 1.5 mg/kg body weight intravenously every 6 hours. ZDV dosing for infants <35 weeks gestation at birth is 1.5 mg/kg/dose intravenously, or 2.0 mg/kg/dose orally, every 12 hours, advancing to every 8 hours at 2 weeks of age if >30 weeks gestation at birth or at 4 weeks of age if <30 weeks gestation at birth.

TABLE 2. Clinical Scenarios and Recommendations for the Use of Antiretroviral Drugs to Reduce Perinatal Human Immunodeficiency Virus Type 1 (HIV-1) Transmission³

SCENARIO #1

HIV-1-infected pregnant women who have not received prior antiretroviral therapy.

- Pregnant women with HIV-1 infection must receive standard clinical, immunologic, and virologic evaluation. Recommendations for initiation and choice of antiretroviral therapy should be based on the same parameters used for persons who are not pregnant, although the known and unknown risks and benefits of such therapy during pregnancy must be considered and discussed.
- The three-part ZDV chemoprophylaxis regimen, initiated after the first trimester, is recommended for all pregnant women with HIV-1 infection regardless of antenatal HIV RNA copy number to reduce the risk for perinatal transmission.
- The combination of ZDV chemoprophylaxis with additional antiretroviral drugs for treatment of HIV-1 infection is recommended for infected women whose clinical, immunologic or virologic status requires treatment or who have HIV-1 RNA over 1,000 copies/mL regardless of clinical or immunologic status, and can be considered for women with HIV-1 RNA < 1,000 copies/mL.
- Women who are in the first trimester of pregnancy may consider delaying initiation of therapy until after 10-12 weeks' gestation.

SCENARIO #2

HIV-1-infected women receiving antiretroviral therapy during the current pregnancy.

- HIV-1 infected women receiving antiretroviral therapy, whose pregnancy is identified after the first trimester, should continue therapy. ZDV should be a component of the antenatal antiretroviral treatment regimen after the first trimester whenever possible, although this may not always be feasible.
- For women receiving antiretroviral therapy, whose pregnancy is recognized during the first trimester: the woman should be counseled regarding the benefits and potential risks of antiretroviral administration during this period, and continuation of therapy should be considered. If therapy is discontinued during the first trimester, all drugs should be stopped and reintroduced simultaneously to avoid the development of drug resistance.
- Regardless of the antepartum antiretroviral regimen, ZDV administration is recommended during the intrapartum period and for the newborn.

SCENARIO #3

HIV-1-infected women in labor who have had no prior therapy.

- Several effective regimens are available (Table 3). These include:
 1. Intrapartum intravenous ZDV followed by six weeks of ZDV for the newborn;
 2. Oral ZDV and 3TC during labor, followed by one week of oral ZDV-3TC for the newborn;
 3. A single dose nevirapine at the onset of labor followed by a single dose of nevirapine for the newborn at age 48 hours; and
 4. The single-dose maternal/infant nevirapine regimen combined with intrapartum intravenous ZDV and six week ZDV for the newborn.
- If single-dose nevirapine is given to the mother, alone or in combination with ZDV, consideration should be given to adding maternal ZDV/3TC starting as soon as possible (intrapartum or immediately postpartum) and continuing for 3 to 7 days, which may reduce development of nevirapine resistance.

In the immediate postpartum period, the woman should have appropriate assessments (e.g., CD4+ count and HIV-1 RNA copy number) to determine whether antiretroviral therapy is recommended for her own health.

SCENARIO #4

Infants born to mothers who have received no antiretroviral therapy during pregnancy or intrapartum.

- The six-week neonatal ZDV component of the ZDV chemoprophylactic regimen should be discussed with the mother and offered for the newborn.
- Some clinicians may choose to use ZDV in combination with other antiretroviral drugs, particularly if the mother is known or suspected to have ZDV-resistant virus. However, the efficacy of this approach for prevention of transmission has not been proven in clinical trials, and appropriate dosing regimens for neonates are incompletely defined for many drugs.
- In the immediate postpartum period, the woman should undergo appropriate assessments (e.g., CD4+ count and HIV-1 RNA copy number) to determine if antiretroviral therapy is required for her own health. The infant should undergo early diagnostic testing so that if HIV-infected, treatment can be initiated as soon as possible.

Note: Discussion of treatment options and recommendations should be noncoercive, and the final decision regarding the use of antiretroviral drugs is the responsibility of the woman. A decision to not accept treatment with ZDV or other drugs should not result in punitive action or denial of care. Use of ZDV should not be denied to a woman who wishes to minimize exposure of the fetus to other antiretroviral drugs and who therefore chooses to receive only ZDV during pregnancy to reduce the risk for perinatal transmission.

TABLE 3. Comparison of Intrapartum/Postpartum Regimens for HIV-1-Infected Women in Labor Who Have Had No Prior Antiretroviral Therapy (Scenario #3)³

Drug Regimen	Source of Evidence	Material Regimen	Infant Postpartum	Date on Transmission	Advantages	Disadvantages
ZDV	Epidemiologic Data, U.S.; Compared to no ZDV Treatment	2 mg/kg intravenous bolus, followed by continuous infusion of 1 mg/kg/hr until delivery	2 mg/kg orally every six hours for six weeks	Transmission 10% with ZDV compared to 27% with no ZDV treatment, a 62% reduction (95% CI, 19- 82%)	Has been standard recommendations	Requires intravenous administration and availability of ZDV intravenous formulation. Adherence to six week infant regimen Reversible, mild anemia with 6 week infant ZDV regimen
ZDV/3TC	Clinical Trial, Africa; Compared to Placebo	ZDV 600 mg orally at onset of labor, followed by 300 mg orally every 3 hours until delivery AND 3TC 150 mg orally at onset of labor, followed by 150 mg orally every 12 hours until delivery	ZDV 4 mg/kg orally every 12 hours AND 3TC 2mg/kg orally every 12 hours for seven days	Transmission at 6 weeks 9% with ZDV-3TC vs. 15% with placebo, a 42% reduction	Oral regimen Adherence Easier than 6 weeks of ZDV	Requires administration of two drugs
Nevirapine	Clinical Trial, Africa; Compared to oral ZDV given intrapartum and for one week to the infant	Single 200 mg oral dose at onset of labor Consider adding intrapartum ZDV/3TC and 3-7 days of ZDV/3TC postpartum to reduce nevirapine resistance	Single 2 mg/kg oral dose at age 48-72 hrs**	Transmission at 6 weeks 12% with nevirapine compared to 21% with ZDV, a 47% reduction (95% CI*, 20-64%)	Inexpensive Oral regimen Simple, easy to administer Can give directly observed treatment	Unknown efficacy if mother has nevirapine-resistant virus Nevirapine resistance mutations have been detected postpartum in some women and in infants who became infected despite prophylaxis
ZDV-Nevirapine	Theoretical	ZDV 2 mg/kg intravenous bolus, followed by continuous infusion of 1 mg/kg/hr until delivery AND Nevirapine single 200 mg oral dose at onset of labor Consider adding intrapartum ZDV/3TC and 3-7 days of ZDV/3TC postpartum to reduce nevirapine resistance	ZDV 2 mg/kg orally every 6 hours for 6 weeks AND Nevirapine single 2 mg/kg oral dose at age 48-72 hours**	No data	Potential benefit if maternal virus is resistant to either nevirapine or ZDV Synergistic inhibition of HIV replication with combination in vitro	Requires intravenous administration and availability of ZDV intravenous formulation

ZDV zidovudine; CI, confidence interval; 3TC, lamivudine

* ZDV dosing for infants <35 weeks gestation at birth is 1.5 mg/kg/dose intravenously, or 2.0 mg/kg/dose orally, every 12 hours, advancing to every 8 hours at 2 weeks of age if >30 weeks gestation at birth or at 4 weeks of age if <30 weeks gestation at birth [121].

**If the mother received nevirapine less than one hour prior to delivery, the infant should be given 2mg/kg oral nevirapine as soon as possible after birth and again at 48-72 hours [243].

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MMWR: *MMWR Morbidity and Mortality Weekly Report*

See Case Report on following pages.

Disclaimer

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Case Report: Preventable Mother-to-Child Transmission

Sunanda Gaur, MD; Manuel Jimenez, MD; Anna Petrova, MD, PhD; Roseann Marone, RN, BSN, MPH

INTRODUCTION



In response to early intervention, the risk of mother-to-child HIV transmission can be reduced from approximately 25% to 2%.¹ Although not optimal, abbreviated courses of anti-retroviral therapy can also significantly reduce vertical transmission.^{2,3} Despite these advances the CDC estimates that between 280 and 370 perinatally-infected infants are born each year in the United States. Many of these cases represent missed opportunities for early intervention and prevention of HIV transmission.

We report a case of mother to child transmission that may have been prevented if a repeat HIV test was administered in the third trimester of gestation.

Case

An 8 month old girl presented to a community institution with a one day history of shortness of breath, congestion, cough and a maximum temperature of 100 degrees Fahrenheit measured at home. The patient had a respiratory rate greater than 80 respirations per minute with retractions. She also appeared cyanotic. Chest x-ray revealed diffuse interstitial infiltrates bilaterally. At this time, the patient was transferred to the Bristol-Myers Squibb Children's Hospital at Robert Wood Johnson University Hospital and was admitted to the pediatric intensive care unit.

The patient was the 8 lb. 8 oz. product of an uncomplicated 38 week gestation and was delivered by natural spontaneous vaginal delivery. The mother is a 25 year old G3 P3 Hispanic woman. Prenatal labs included rubella immune, hepatitis B negative, and GBS negative.

The mother tested negative for HIV during her first trimester. The patient has two siblings who were the products of two previous and separate relationships. The mother reported that she was HIV negative during both of these pregnancies and had been in a monog-

amous relationship with the patient's father for the previous two years. He had no known HIV risk behaviors, however, his HIV status was unknown. The mother denied IV drug use.

The patient's past medical history was significant for three hospitalizations at another institution at three months of age for bronchiolitis, again at five months of age for bronchiolitis, and at six months of age for pneumonia. Medications included inhaled budesonide twice daily and Albuterol every six hours. There were no known drug or food allergies at the time of hospitalization.

On physical examination, the patient was afebrile with a respiratory rate of 80 breaths per minute and 98% O₂ saturation on 100% non re-breather, heart rate was 148 beats per minute. The patient weighed 6 kg, which was below the third percentile for her age. The patient appeared to be in moderate respiratory distress. Respiratory exam revealed supraclavicular and subcoastal retractions with decreased air entry especially at the right base and diffuse crackles bilaterally on auscultation. Cardiovascular exam was significant for tachycardia. Extremities were well perfused with capillary refill under 2 seconds.

Neurologically, the patient had poor head control, mildly decreased tone of all four extremities and was unable to sit independently.

Laboratory values included white blood cell count 9500 wbc/mL, neutrophils 40%, lymphs 45%, Chest x-ray revealed diffuse interstitial infiltrates bilaterally.

The patient was intubated and started on ceftriaxone 200 mg IV every 12 hours, azithromycin 80 mg every 24 hours and trimethoprim/sulfamethoxazole 30 mg every 6 hours. The infectious disease service was consulted to rule out immunodeficiency. The workup included silver stain of the sputum, which was positive for *pneumocystis jiroveci pneumonia*. The mother was counseled and encouraged to undergo rapid HIV testing, which was reactive and confirmed with a Western Blot. Subsequently an HIV viral load was sent for the patient, which was 750,000 copies/mL. The patient was started on a 21 day course of methylprednisolone sodium succinate and trimethoprim/sulfamethoxazole. She was diagnosed with AIDS and started on zidovudine 62 mg three times daily, lamivudine 33 mg twice daily and nelfinavir 500 mg twice daily. The patient was stabilized, extubated after 20 days and was discharged for rehabilitation. The patient is currently followed as an outpatient.

Discussion

Although mother-to-child transmission of HIV could theoretically be eliminated in resource-rich settings, women infected with HIV continue to be missed for early intervention.¹ Lack of HIV testing has been shown to be highly associated with mother-to-child HIV transmission.² In 1995, the United States Public Health Service recommended universal counseling and voluntary HIV testing for all pregnant women.³ In 2001, the US Public Health Service revised its guidelines empha-

sizing the importance of early detection of HIV and increasing accessibility of testing.⁴ The American College of Obstetrics and Gynecology (ACOG), CDC, and NJDHSS have recognized the utility of repeat third trimester testing and the rapid HIV test at labor and delivery as strategies that could potentially further reduce the rate of mother-to-child HIV transmission.⁵ ACOG recommends a repeat offer of HIV testing in the third trimester to women in areas with high HIV prevalence among women of child bearing age defined as 0.5 % or greater, women known to be at high risk for HIV infection, and women who declined testing earlier. In high risk areas a second voluntary universal HIV test in the third trimester could result in a net savings to society.⁶

Among the other states in the union, New Jersey ranks fifth in cumulative AIDS cases,

third in pediatric AIDS cases, and has the largest proportion of women living with AIDS.⁷ Nationally, the estimated rate for adults and adolescents living with HIV infection is 136.7 per 100,000 population, the rate for AIDS equals 168.8 per 100,000 population.⁸ Meanwhile, in New Jersey, the rate for adults and adolescents living with HIV and AIDS are estimated at 208.5 per 100,000 population and 241.7 per 100,000 population respectively. The HIV prevalence among childbearing women in New Jersey was 0.2% in 2003.⁹ However, significant variability exists when race/ethnicity and county of residence are taken into account, with several pockets of much higher prevalence.

The above case represents a patient whose mother had no identifiable HIV risk factors. The mother tested negative early in preg-

nancy and went on to transmit HIV to her child. This case could have been prevented if repeat testing had been offered in the third trimester, however according to ACOG guidelines it was not indicated. Although New Jersey is in fact a high prevalence area,¹² the prevalence of HIV among child-bearing women in New Jersey falls beneath the 0.5% threshold for repeat third trimester HIV testing as per the 2004 ACOG recommendation. This case argues for the new CDC recommendation for administration of routine third trimester testing in all high prevalence areas. Although mother to child transmission of HIV has been significantly reduced, a rate of zero transmission can only be achieved through constructive discussion of the remaining cases.

Continuing Education Section continues on next page.

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MMWR: MMWR Morbidity and Mortality Weekly Report



REDUCING VERTICAL HIV TRANSMISSION IN NEW JERSEY

Self-Assessment Test

Questions refer to the content of the article and the notes that follow. To receive CME/CEU credit: complete exam, registration, and evaluation forms on-line at <http://ccoe.umdj.edu/online/AIDSLine/index.htm> or fill in the forms on the next two (2) pages, and mail or fax to UMDNJ-CCOE (see next page).

- 1. Counseling for women with HIV infection to reduce the risk of vertical HIV transmission should begin at which of the following times?**
 - A. Pre-conceptual
 - B. First trimester
 - C. Second trimester
 - D. Third trimester
- 2. Ideally, antiretroviral therapy to reduce the risk of vertical HIV transmission should start at which of the following gestational ages?**
 - A. First trimester
 - B. Second trimester
 - C. Third trimester
 - D. Labor/delivery
- 3. Which of the following antiretroviral agents is recommended as part of the regimen to reduce the risk of vertical HIV transmission, whenever possible?**
 - A. Efavirenz
 - B. Lamivudine
 - C. Zidovudine
 - D. Nevirapine
- 4. Which of the following is recommended for women who present in labor with unknown HIV status?**
 - A. HIV counseling
 - B. HIV rapid testing
 - C. Short course therapy if HIV test is positive
 - D. All of the above
- 5. New Jersey law on HIV counseling and testing of pregnant women:**
 - A. Mandates HIV counseling and testing
 - B. Mandates universal HIV testing
 - C. Requires HIV counseling for all pregnant women and voluntary testing
 - D. Recommends HIV counseling and voluntary testing
- 6. The New Jersey statewide standard of care recommends that HIV counseling and voluntary rapid/expressed testing be offered to:**
 - A. Women with no record of prenatal care
 - B. Women who present in labor with unknown or undocumented HIV status
 - C. Women who refused HIV testing during their prenatal care
 - D. All of the above
- 7. Nevirapine monotherapy to reduce perinatal HIV transmission, compared to other regimens, is:**
 - A. Less likely to cause resistance.
 - B. More difficult to administer than ZDV, the standard intervention.
 - C. Not recommended as monotherapy.
 - D. All of above.
- 8. The most common "missed opportunities" in reducing vertical HIV transmission reported recently in New Jersey have been when an HIV+ infant is born to a woman who:**
 - A. Did not receive prenatal care prior to delivery, or had only one or two visits
 - B. Did not receive antiretroviral medication during labor and delivery
 - C. Did not have HIV counseling and testing offered to her during pregnancy
 - D. Presents in labor with unknown HIV status
- 9. HIV counseling and testing for pregnant women is most effective when the prenatal care provider:**
 - A. Makes it clear that testing is available for all patients who request it.
 - B. Strongly recommends HIV testing with repeat testing in 3rd trimester for all prenatal patients.
 - C. Screens to identify high-risk patients such as IV drug users or women with multiple sex partners.
 - D. Offers referrals to separate HIV counseling and testing sites.
- 10. Which of the following is considered appropriate therapy for HIV-1 infected women in labor?**
 - A. Intrapartum intravenous ZDV followed by six weeks of ZDV for the newborn.
 - B. Single-dose maternal/ infant Efavirenz at the onset of labor followed by a single dose of Efavirenz for the newborn at age 48 hours
 - C. Intravenous ZDV for 3-7 days.
 - D. Oral ZDV five times daily for six week.



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REDUCING VERTICAL HIV TRANSMISSION IN NEW JERSEY

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	2. A B C D	4. A B C D	6. A B C D	8. A B C D	10. A B C D

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REDUCING VERTICAL HIV TRANSMISSION IN NEW JERSEY

Activity Evaluation Form



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The planning and execution of useful and educationally sound continuing education activities are guided in large part by input from participants. To assist us in evaluating the effectiveness of this activity and to make recommendations for future educational offerings, please take a few moments to complete this evaluation form. Your response will help ensure that future programs are informative and meet the educational needs of all participants.

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PROGRAM OBJECTIVES: Having completed this activity, are you better able to:	Strongly Agree		Strongly Disagree		
<i>Objective 1:</i> Explain the rationale for pre-conceptual counseling of women with HIV infection.	5	4	3	2	1
<i>Objective 2:</i> Understand the role of short course antiretroviral therapy in reducing the risk of perinatal HIV transmission	5	4	3	2	1
<i>Objective 3:</i> Describe the role of HIV counseling and rapid HIV testing for women who present in labor with unknown HIV status.	5	4	3	2	1
<i>Objective 4:</i> Summarize new guidelines for HIV counseling and testing in pregnancy.	5	4	3	2	1

OVERALL EVALUATION:	Strongly Agree		Strongly Disagree		
The information presented increased my awareness/understanding of the subject.	5	4	3	2	1
The information presented will influence how I practice.	5	4	3	2	1
The information presented will help me improve patient care.	5	4	3	2	1
The faculty demonstrated current knowledge of the subject.	5	4	3	2	1
The program was educationally sound and scientifically balanced.	5	4	3	2	1
The program avoided commercial bias or influence.	5	4	3	2	1
Overall, the program met my expectations.	5	4	3	2	1
I would recommend this program to my colleagues.	5	4	3	2	1

If you anticipate changing one or more aspects of your practice as a result of your participation in this activity, please provide us with a brief description of how you plan to do so.

Please provide any additional comments pertaining to this activity (positives and negatives) and suggestions for improvement. Please list any topics that you would like to be addressed in future educational activities:
