photo: Jon Hrusa

Pediatric HIV and AIDS

What is HIV?

The human immunodeficiency virus (HIV) is the agent that causes acquired immunodeficiency syndrome (AIDS). The virus can be transmitted during sexual intercourse, pregnancy (i.e., from mother to fetus), childbirth, breastfeeding, or exposure to blood containing the virus, such as through use of contaminated needles or blood products. In the body, the virus enters vital immune cells called CD4 cells. CD4 cells coordinate the immune system's fight against infections. HIV causes destruction and impaired function of the body's CD4 cells—and in the absence of treatment, HIV continues to replicate itself within the body, eventually leading to severe immunodeficiency, chronic illness, and death.

What is AIDS?

Acquired immunodeficiency syndrome (AIDS) develops after prolonged damage to the immune system caused by HIV and represents an advanced stage of HIV infection. In most cases, a person living with HIV eventually develops AIDS, often after being infected for many years. AIDS is characterized by severely diminished immune system function, which means that the body is highly vulnerable to infections and cancers that are typically fought off by a healthy immune system. As defined by the United States Centers for Disease Control and Prevention, a person has AIDS when HIV has drastically reduced his or her CD4 cell count, or when a person living with HIV is diagnosed with at least one opportunistic infection (i.e., an infection that does not normally occur in someone with a healthy immune system) or other AIDS-defining condition.

What are the challenges to developing a pediatric vaccine?

Despite the potential benefits, children have been largely excluded from HIV vaccine research. Of the more than 190 HIV vaccine trials that have been completed to date, less than two percent have included children. This sobering statistic reflects a reluctance to test vaccine candidates in infants and young children without first demonstrating the vaccine's potential efficacy in adults. Continuing to test vaccine candidates in adults alone will make it impossible to establish their potential efficacy in infants and children, a population that deserves to benefit from a successful vaccine.

How many children are living with HIV?

Of the 34 million people globally living with HIV in 2010, 3.4 million were children. In 2010 alone, 390,000 children were newly infected with HIV. In fact, more than 1,000 children become infected with HIV every day, representing one in seven new infections globally (World Health Organization [WHO], *Global HIV/AIDS Response*, 2011).

How do children become infected with HIV?

More than 90 percent of HIV infections in children result from mother-to-child transmission, where the virus is passed from a mother living with HIV to her baby during pregnancy, childbirth, or breastfeeding. While the precise mechanisms for viral transmission during pregnancy are not fully understood, the risk of this form of transmission increases in direct relation to the severity of the mother's HIV infection.

How does HIV affect children?

Because children's immune systems are not fully developed, they are particularly vulnerable to HIV infection. Children living with HIV get sick more rapidly than adults. They may experience the same common pediatric infections as HIV-negative children, but

children living with HIV cannot fight these infections as effectively. Serious illness in HIV-positive children tends to be frequent and can be difficult to treat. Common infections in HIV-positive children include ear and sinus infections, sepsis, pneumonia, urinary tract infections, intestinal illness, skin disease, and meningitis. In developing countries in particular, tuberculosis, diarrhea, and respiratory illnesses are common in HIV-positive children.

How can HIV infection in children be prevented?

Currently available approaches to preventing HIV infections in infants can reduce the risk of mother-to-child virus transmission to less than two percent. The most effective method for preventing mother-to-child HIV transmission is by initiating lifelong antiretroviral therapy (ART) as early as possible in treatment-eligible HIV-positive pregnant women. In cases where a woman is not eligible for ART or ART is not available, a shorter, simplified course of antiretroviral (ARV) drugs can be given to the mother, starting early in pregnancy, and to her infant immediately following delivery. Extending the course of ARVs through the breastfeeding period in locations where breastfeeding is important to the survival of the infant also decreases the likelihood of HIV transmission via breast milk. Proven highly effective at preventing HIV transmission from mother to child, ARVs decrease the amount of virus in the mother's bloodstream (i.e., viral load), thus reducing the risk that she will transmit the infection to her infant. These drugs also have a protective effect on the child before and after birth, helping the child resist HIV infection. According to PEPFAR, the use of ARV drugs has averted an estimated 350,000 new HIV infections in children over the last 16 years, the vast majority since 2005. Yet, only 48 percent of HIV-positive pregnant women worldwide are receiving this critical intervention (WHO, 2011).

How is HIV infection in children treated?

There is no cure for HIV infection. However, early infant diagnosis is critical since ART, when administered as early as possible in the course of infection, can help HIV-positive children lead long healthier lives. Taken every day, these medicines can drastically reduce the concentration of HIV in the bloodstream and improve the ability to fight off other infections, thereby dramatically slowing the progression of the disease. Sadly, most children still do not have access to these lifesaving medications. It is estimated that almost half of HIV-positive children will die before their second birthdays in the absence of treatment (WHO, 2011).

How is the Elizabeth Glaser Pediatric AIDS Foundation working to eliminate pediatric AIDS?

For 20 years, the Foundation has led the way in the fight to prevent pediatric HIV infection, eliminate pediatric AIDS, and create a generation free of HIV. The Foundation supports the early identification of HIV-positive pregnant women and initiation of ART in all treatment-eligible pregnant women and children. The Foundation also advocates for expanded access to appropriate HIV care and treatment for non-treatment-eligible pregnant women living with HIV and HIV-exposed infants, as well as infant and young child feeding strategies that promote the long-term HIV-free survival of infants born to HIV-positive mothers.

The Foundation works in partnership with national ministries of health and a range of other partners to provide localized responses to the spread of HIV in more than 5,600 sites around the world. The Foundation's program implementation, research, and advocacy activities are helping to eliminate HIV infection in infants and children and increase access to comprehensive, high-quality, and well-integrated services to prevent mother-to-child HIV transmission and to provide care and treatment for HIV-positive pregnant women, children, and families.

By September 30, 2011, Foundation-supported programs had:

- Provided more than 13.6 million women with services to prevent transmission of HIV to their babies;
- Tested nearly 12 million women for HIV through Foundation programs;
- Enrolled more than 1.4 million individuals, including nearly 110,000 children under the age of 15, into Foundation-supported care and treatment programs; and
- Started more than 780,000 individuals on antiretroviral treatment, including more than 60,000 children under the age of 15.

To find out more about the Foundation's work to eliminate pediatric AIDS, visit www.pedaids.org.

Elizabeth Glaser acquired HIV through a blood transfusion and unknowingly passed the virus on to her daughter, Ariel, and her son, Jake. Following Ariel's death in 1988, Elizabeth joined with two close friends with one goal: to bring hope to children with AIDS. The Foundation that now bears Elizabeth Glaser's name has become a global leader in the effort to eliminate pediatric AIDS, working in 16 countries and at more than 5,900 sites around the world to prevent the transmission of HIV to children and help those already infected with the virus. The Foundation's global mission is to implement prevention, care, and treatment; further advance innovative research; and give those affected by HIV and AIDS a voice to bring dramatic change to the lives of millions of children, women, and families worldwide.