

## Evidence for the Cure of HIV Infection by CCR5 $\Delta$ 32/ $\Delta$ 32 Stem Cell Transplantation

Allers K, Hütter G, Hofmann J, et al. *Blood*. 2011;117(10):2791–2799

**PURPOSE OF THE STUDY.** HIV uses CD4<sup>+</sup> as its primary receptor and chemokine receptors (CCR5 and CXCR4) as co-receptors. The primary receptor used to transmit HIV between people, including in maternal-child transmission, is CCR5. Approximately 1% of northern Europeans have a homozygous deletion ( $\Delta$ 32) in the *CCR5* gene that dramatically increases the resistance to HIV infection in affected people. There has been great speculation as to the “curability” of active HIV infection. The purpose of this study was to describe the apparent cure of a single patient.

**STUDY POPULATION.** The case of a single person who received a stem cell transplant from a donor with “natural” resistance to HIV was reported.

**METHODS.** Extensive immunologic, virologic, and genetic tests were performed serially on this person.

**RESULTS.** The patient received a successful transplant for treatment of relapsed acute myeloid leukemia. Long-term follow-up, 4 years at the time of writing, revealed that the patient’s CD4<sup>+</sup> T cells recovered efficiently; donor-derived CD4<sup>+</sup> T cells repopulated the gut mucosal immune system; in vitro alternative chemokine receptor usage, CXCR4, was not impaired on the new T cells; long-lived HIV target cells of host origin (tissue CD4<sup>+</sup> T cells and macrophages) were replaced with donor-derived cells after transplantation; and HIV remains undetectable in peripheral blood and multiple tissue compartments over the 45-month course of observation.

**CONCLUSIONS.** This patient was cured of HIV infection.

**REVIEWER COMMENTS.** The now-famous person often referred to as the “German patient,” although in reality an American living in Berlin, provides proof of concept that HIV infection is a curable disease. Although the identification of a CCR5 $\Delta$ 32/ $\Delta$ 32 donor is impractical for almost all other people with HIV, the experience with the German patient has led to a dramatic increase in the attempt to cure HIV. Multiple approaches have been proposed, and many would be applicable to the “average” HIV-infected person. This is reflected in a recent article entitled “The Emerging Race to Cure HIV Infections” (*Science*. 2011;332[6031]:784–789).

URL: [www.pediatrics.org/cgi/doi/10.1542/peds.2011-2107III](http://www.pediatrics.org/cgi/doi/10.1542/peds.2011-2107III)

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## Evaluation of 4 Weeks’ Neonatal Antiretroviral Prophylaxis as a Component of a Prevention of Mother-to-Child Transmission Program in a Resource-Rich Setting

Ferguson W, Goode M, Walsh A, Gavin P, Butler K. *Pediatr Infect Dis J*. 2011;30(5):408–412

**PURPOSE OF THE STUDY.** A 6-week course of neonatal antiretroviral prophylaxis has been standard in most developed countries. In the same settings, a 4-week rather than 6-week intervention might reduce toxicity and reduce cost.

**STUDY POPULATION.** The study involved a cohort that included all HIV-exposed live births in Ireland from January 1999 through December 2008 with a minimum of 18-months of follow-up.

**METHODS.** This was a 10-year observational study of the Irish experience in their use of a 4-week rather than 6-week neonatal antiretroviral regimen.

**RESULTS.** Of the 916 infants with known outcome, 1% were infected. If analysis was limited to the 910 infants whose mothers received at least 4 weeks of antiretroviral therapy, the vertical transmission rate was 0.4%. These numbers are consistent with those found in other areas in which the standard 6-week regimen is followed.

**CONCLUSIONS.** The current clinical practice of using a 4-week neonatal antiretroviral prevention regimen seems to be as effective as a 6-week regimen.

**REVIEWER COMMENTS.** Although it is reasonable to surmise that a 4-week regimen is as effective as a 6-week regimen in preventing vertical transmission of HIV, the data presented here are unlikely to convince the public health authorities of other countries to move in this direction. This was not a controlled trial, and the patient population might differ in other countries.

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## Cardiac Effects of Antiretroviral Therapy in HIV-Negative Infants Born to HIV-Positive Mothers: NHLBI CHAART-1 (National Heart, Lung, and Blood Institute Cardiovascular Status of HAART Therapy in HIV-Exposed Infants and Children Cohort Study)

Lipshultz SE, Shearer WT, Thompson B, et al. *J Am Coll Cardiol*. 2011;57(1):76–85

**PURPOSE OF THE STUDY.** HIV is known to cause a cardiomyopathy. In addition, the mitochondrial abnormalities reported in children exposed to antiretroviral therapy but not infected with HIV might also be associated abnormal

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