

Woman cured of HIV after stem cell transplant

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In news—Recently, a patient in the US has become the third person in the world, and the first woman, to be cured of HIV after receiving a stem cell transplant from a donor who was naturally resistant to HIV.

About stem cell transplantation-

- In 2013, the **mixed-race woman, now known as the 'New York patient'**, was diagnosed with HIV.
- She began to receive antiretroviral drugs to keep her virus levels low.
- Four years later, she was diagnosed with leukaemia in 2017.
- As part of her cancer treatment, she received a **transplant of umbilical cord blood** from someone who had a natural resistance to HIV.
- The blood from the umbilical cord contained a mutation that blocks HIV and since then, she has not required antiretroviral therapy.
- Significantly, it was sourced from a partially-matched donor.
- Similar transplant procedures that are done using bone marrow require an exact match.
- Apart from being a major medical breakthrough, this case is significant for two reasons.
- First, this was the first time an umbilical cord blood transplant was successfully carried out on an HIV patient.
- Second, the patient was a middle-aged mixed-race woman and this is significant since the majority of donors in the US are of Caucasian descent.
- Since this breakthrough treatment only requires partial

matches and not exact matches, it opens up treatment options for people from diverse racial backgrounds.

About Human immunodeficiency virus(HIV)-

- HIV is an infection that **attacks the immune system by destroying the body's immune cells called CD4**, which help it respond to infection.
- **Once HIV attacks the CD4 cells, it starts replicating and destroying the cells, weakening the body's immune system** and making it more prone to certain "opportunistic infections" that take advantage of the weak immune system.
- **Bodily fluids such as blood, semen, vaginal fluids, rectal fluids and breastmilk can be carriers for HIV.**
- It can be **transmitted through unprotected sex, transfusion of contaminated blood, sharing needles** and syringes, and from a mother with HIV to her infant during pregnancy.
- Typically, the time between HIV transmission and AIDS diagnosis is 10-15 years, although it may occur sooner.

How were the first two HIV patients cured?

- **Timothy Ray Brown from Berlin was the first person to be "cured" of HIV** after receiving a stem cell transplant **in 2007.**
- **Adam Castillejo from London was the second person in the world to be cured of HIV in 2020.**
- In both cases, the two patients received transplants from donors who have an uncommon gene that gives them protection against HIV.
- Unlike in the case of the New York patient, both Brown and Castillejo received adult stem cells as part of bone marrow transplants.
- While adult stem cells are more difficult to find, umbilical cord blood is more widely available. It also

does not require as close a match with the donor.

- Both men suffered severe side effects following the bone marrow transplants, including graft-versus-host disease. In fact, Brown nearly died after his transplant.

Further

reading:

<https://journalsofindia.com/moderna-begins-trial-of-hiv-vaccine-that-uses-mrna-technology/>