

Would you rather die of liver failure or live with HIV?

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This was the ethical dilemma faced by doctors at Wits Donald Gordon

Medical Centre to save a child's life.

In 2017, doctors from the Transplant Unit at the Wits Donald Gordon Medical Centre performed what is believed to be the world's first intentional liver [transplant](#) from a mother living with HIV to her critically ill HIV negative child, who had end-stage liver disease.

Now, more than a year later, the mother and child have fully recovered, however, doctors are unsure the HIV-status of the child.

In South Africa, a country with the largest anti-retroviral therapy (ART) programme in the world, people with HIV live long and healthy lives.

The success of this world-first operation thus presents a potential new pool of living donors that could save additional lives.

Leveraging "living positive" to save more lives

In a paper published in prestigious, peer-reviewed journal *AIDS* on October 4, 2018, scientists in surgery, ethics, and HIV from the University of Witwatersrand, Johannesburg (Wits) explain how a chronic shortage of organs compromise their efforts to save lives, and how the decision they made to perform a world-first operation could advance transplantation.

Jean Botha, principal investigator and transplant surgeon is Professor of Surgery in the Department of Surgery in the School of Clinical Medicine, Faculty of Health Sciences at Wits University.

"Two aspects of this case are unique. Firstly, it involved intentional donation of an organ from a living HIV positive individual. Secondly, pre-exposure prophylaxis [medication to protect at-risk individuals from contracting the HI virus] in the child who received the organ may have

prevented the transmission of HIV. However, we will only know this conclusively over time," says Botha, who is also Director of Transplantation at the Transplant Unit at the Wits Donald Gordon Medical Centre.

Currently, the Wits Donald Gordon Medical Centre is the only Transplant Programme doing living [donor](#) liver transplantation in southern Africa. It is also the first privately administered teaching hospital in Johannesburg and, as a Wits hospital, advances specialist training and research.

Stringent adherence to ethical guidelines

In this case of transplanting a liver from an HIV positive donor to a non-infected recipient, the transplant team had to unpack the potential risks and benefits to both. The Human Research Ethics Committee (Medical) at Wits University approved the liver transplantation from the mother living with HIV to her HIV negative child. Their personal details remain confidential.

The child—on the waiting list for a deceased donor for 180 days (the average is 45 days) - was frequently admitted for life-threatening complications of end-stage liver disease. Without transplant, the child would certainly have died. However, saving the child's life needed to be balanced against harm to the donor and the risk of almost certainly transmitting HIV if the mother was the donor.

Dr. Harriet Etheredge is a medical bioethicist who holds an honorary position in the Department of Internal Medicine, School of Clinical Medicine at Wits, and oversees Ethics and Regulatory Issues at the Wits Donald Gordon Medical Centre.

"Extensive efforts were made to identify either a deceased liver donor or

an HIV negative living donor for the child before considering an HIV positive parent donor. Transplanting HIV positive organs is not illegal in South Africa; however, it is not considered best practice internationally because of the risk of HIV transmission to the recipient. To minimise risk to donors and recipients, this operation is offered only under exceptional circumstances. Full consent is required from the parents who must be able to care for a child infected with HIV," says Etheredge, whose Ph.D. is in the field of medical ethics and organ transplantation.

In this transplantation case, the mother asked a number of times for the opportunity to save her child's life by donating a segment of her liver. For this mother, quantifying the risk was simpler for the transplant team. Dr. Francesca Conradie, HIV clinician, notes, "When considering an HIV positive parent, it is important that they have an undetectable viral load. This means that they know they are HIV positive and that they have been taking their antiretroviral medication properly for at least six months".

This made the risk of donation equivalent to that of an HIV negative living donor. However, living liver donation is never a risk-free procedure, and the team took care to ensure that the mother understood the full ambit of the risk she was undertaking.

"Our Independent Donor Advocate helps the parents understand the risks, makes representations to the transplant team on behalf of the donor if necessary, and provides emotional support throughout the process," says Etheredge.

Intentional transmission of HIV to save a life

The transplant team faced the dilemma of saving the child's life whilst at the same time knowing that the child might end up HIV positive because of this decision. However, because this intentional HIV positive living

donor liver transplant is likely a world first, the actual chance of transmitting HIV was unknown.

The team decided to work on the basis that the child would contract HIV, and provide management accordingly. But in the time since the transplant, there have been some surprises when it comes to the child's HIV status.

"In the weeks after the transplant, we thought that the child was HIV positive, because we detected HIV antibodies," says Botha.

The transplant team then accessed specialised testing by HIV experts at the National Institute of Communicable Diseases (NICD) who subsequently could not find any active HIV infection in the blood stream of the child, meaning there is a chance that the child is HIV negative.

Caroline Tiemessen is Research Professor in the School of Pathology at Wits and head of Cell Biology within the Centre for HIV and STIs.

"At the moment, we are developing new methods for testing the child, and we hope to be able to have a definitive answer to the question of seroconversion in future. For now the child will remain on ART until we have a more comprehensive picture," says Tiemessen who, in 2017, led the laboratory investigations in the case where of a South African child living with HIV had remained in remission without ART since 2008.

Seroconversion is the period of time during which a specific antibody develops and becomes detectable in the blood. After seroconversion has occurred, HIV can be detected in blood tests for the antibody.

Expanded organ donor pool to advance transplantation in Africa

More than a year since the intentional liver transplantation from a mother living with HIV to her HIV negative [child](#), both donor and recipient have recovered and are well.

Dr. June Fabian, a nephrologist and Research Director at Wits Donald Gordon Medical Centre says, "We have formalised this procedure as a research programme. As we offer this type of transplantation to more children, we hope to be able to draw more definitive conclusions."

Organ transplantation at the Wits Donald Gordon Medical Centre is offered to any person irrespective of income or demographic according to "sickest first" criterion. This is possible through an existing partnership between the Wits Donald Gordon Medical Centre and the Gauteng Department of Health.

"We hope that this ground-breaking operation will be the first of many like it and will contribute towards promoting justice and equity in liver transplantation in South Africa," says Fabian.

More information: Jean Botha et al, Living donor liver transplant from an HIV-positive mother to her HIV-negative child, *AIDS* (2018). [DOI: 10.1097/QAD.0000000000002000](https://doi.org/10.1097/QAD.0000000000002000)

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