

HIV Treatment May Slow Down Accelerated Aging

People with HIV are prone to developing health problems at younger ages than their HIV-negative peers, but prompt antiretroviral treatment can help.

May 6, 2026 By [Liz Highleyman](#)

Use of antiretroviral treatment may slow accelerated biological aging by nearly four years, according to study results presented at the Congress of the European Society of Clinical Microbiology and Infectious Diseases in Munich (ESCMID Global 2026).

“This research demonstrates the importance of early start and optimal adherence to antiretroviral therapy,” lead study author Barry Ryan, PhD, of the Swiss technical university EPFL, said in an [ESCMID Global news release](#).

People living with HIV are prone to developing comorbidities, such as [cardiovascular disease](#), certain cancers and [cognitive impairment](#), earlier than their HIV-negative peers. Despite antiretroviral treatment, HIV remains in the body and can cause persistent immune activation and chronic inflammation that leads to a host of health problems.

But the new research shows that starting and staying on effective antiretroviral therapy (ART) can help reduce this accelerated biological aging. There are many existing biological age clocks—which aim to estimate physiological rather than chronological age—but they have not been well studied in people with HIV.

Based on patterns of hundreds of proteins in the blood, Ryan and colleagues developed a proteomic aging clock that mainly captures changes in inflammatory markers and drug metabolomic pathways. The researchers [previously developed an epigenetic aging clock](#) using the same cohort.

The model was applied to participants in the [Swiss HIV Cohort Study](#), a large prospective cohort study that has been running for nearly four decades. The proteomic aging clock was first trained on 941 blood plasma samples from HIV-positive people on effective antiretroviral treatment. It was then evaluated using a separate group of 80 people who contributed 294 longitudinal samples, spanning from before treatment initiation to viral suppression on ART.

Prior to treatment, the clock estimated that participants’ biological age was accelerated by a

median of 10 years. But after a median duration of 1.6 years on antiretrovirals, the researchers observed an average reduction of 3.7 years in proteomic age. The longer treatment continued, the more proteomic age moved closer to chronological age, suggesting ongoing biological recovery.

The proteomic clock and the earlier epigenetic clock showed similar overall trends, but the new proteomic clock was more sensitive to short-term immune changes, showing a faster increase. The effect was not mediated by CD4 T-cell count, Ryan noted, suggesting that HIV-related inflammation and immune activation may not be fully captured by clinical markers like CD4 count alone.

“We’re extremely fortunate to have a unique group from the Swiss HIV Cohort Study who had samples collected for up to eight years before they started ART,” Ryan said in the news release. “With this group, we have measured the effect of untreated HIV infection and successful ART on telomere shortening, epigenetic aging and now proteomic aging. In each case we have shown that uncontrolled HIV infection is linked to faster aging and that ART significantly slows this.”

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