Top HIV Science Stories of 2025

Twice-yearly PrEP makes its debut, novel HIV treatments are in the pipeline and metabolic health gets more attention.

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Website traffic isn't always the best indicator of the most important scientific advances in HIV. Cure stories are always among the most popular—even when advances are modest—and a specific article will sometimes inexplicably go viral. Instead, here are editorial picks for 10 of the key HIV science stories of 2025. However, these don't include perhaps the year's biggest new in the HIV/AIDS world: the dramatic impact on research, prevention and domestic and global services due to the Trump administration's funding cuts and interference with federal health agencies.

1. Lenacapavir PrEP

Results from the from the PURPOSE 1 and PURPOSE 2 trials were released in 2024, showing that twice-yearly lenacapavir pre-exposure prophylaxis (PrEP) was highly effective, leading Science magazine to name it the Breakthrough of the Year—and the prevention breakthrough continued to dominate headlines in 2025. The Food and Drug Administration approved lenacapavir PrEP, branded as Yeztugo, in June, and the Centers for Disease Control and Prevention (CDC) recommended it as a new prevention option in September. Studies showed that lenacapavir PrEP is effective for youth, transgender people and people who use drugs or alcohol. And new data suggest that once-yearly shots might work equally well. But as lenacapavir PrEP rolls out in the United States and worldwide, cost and access remain a concern.

2. New PEP Guidance

While PrEP gets the lion's share of attention, 2025 saw the first change in post-exposure prophylaxis guidance (PEP) guidance in nearly a decade. PEP is a month-long course of antiretrovirals started as soon as possible after sex or another type of exposure to HIV. Until this year, the CDC still recommended the older HIV meds raltegravir (Isentress) or dolutegravir (Tivicay) plus tenofovir disoproxil fumarate/emtricitabine (Truvada or generic equivalents) for PEP. But in May, the agency gave the nod to Biktarvy (bictegravir/tenofovir alafenamide/emtricitabine), a complete single-tablet regimen taken once a day.

3. Novel Antiretrovirals

Modern antiretroviral regimens are effective, safe and convenient, so the development of new meds has become less of a priority, but the HIV pipeline is far from empty. In 2025, researchers presented promising data on oral versions of VH-184, a novel integrase inhibitor, and VH-499, an experimental capsid inhibitor, laying the groundwork for development of long-acting injectable formulations. A once-weekly oral combination of lenacapavir plus islatravir—the first nucleoside reverse transcriptase translocation inhibitor—maintained viral suppression for two years. Also in the pipeline: ulonivirine, a novel non-nucleoside reverse transcriptase inhibitor; HRF-10071, which would be the first HIV maturation inhibitor; and MK-8527, a once-monthly oral PrEP candidate.

4. Immunotherapy

Beyond antiretrovirals, researchers are exploring novel types of immunotherapy, which aims to strengthen the immune system's response against HIV and potentially allow people to stay off antiretroviral therapy for a prolonged period, known as a functional cure. Broadly neutralizing antibodies might be combined with antiretrovirals such as lenacapavir and cabotegravir in longer-acting treatment regimens, and they could potentially keep HIV in remission after stopping antiretrovirals. Novel agents being studied for a functional cure include the IL-15 superagonist Anktiva (N-803) and the bispecific T-cell engager IMC-M113V.

5. Two More Cures

Despite decades of effort, there is still no broadly applicable cure for HIV. But 2025 brought news of two more cases of people who were cured after receiving stem cell transplants for cancer treatment—dubbed the Chicago Patient and the Oslo Patient—bringing the total to 10. Stem cell transplants are too risky for HIV-positive people who are not also facing life-threatening cancer, but each new case offers clues that could help researchers develop a scalable functional cure.

6. Progress on HIV Vaccines

There is also still no effective vaccine to prevent HIV, but researchers have not given up hope. After several traditional vaccine candidates failed to prevent HIV acquisition in large clinical trials, scientists have turned to more sophisticated approaches. One strategy, known as germline targeting, uses a series of vaccines in a stepwise manner to encourage the development of specialized B cells that can produce broadly neutralizing antibodies (bnAbs). Researchers are making slow progress, but it will likely be years before large trials can test whether novel vaccine candidates prevent HIV, especially as the Trump administration cuts funding for vaccine research.

7. HIV Diagnoses Rise

After a few years of uncertainty as the COVID-19 pandemic disrupted HIV testing and monitoring, the latest surveillance data from the CDC show that new HIV diagnoses rose by about 1,000 cases

nationwide in 2023. According to the new report, 39,201 people in the U.S. and its territories were diagnosed with HIV that year, up from 37,981 in 2022. Over half of newly diagnosed people lived in the South, 38% were Black and more than a third were Latino. Men accounted for 81% of new diagnoses, while women made up 19%; unlike past reports, there is no mention of transgender people, in keeping with the federal government's new mandate to root out "gender ideology." These data do not yet reflect the effects of the Trump administration's cuts to funding for HIV services, and advocates fear numbers could rise further in the future. What's more, HIV specialists are already in short supply, and experts estimate that the U.S. will need more than 1,500 additional experienced HIV health care providers to meet goals for HIV testing and treatment.

8. Mpox Is Still a Threat

The large outbreak of mpox (also known as monkeypox) among gay and bisexual men was the big news in 2022, but the virus hasn't gone away. That outbreak was caused by monkeypox virus Clade II, which appears to be less severe and seems to spread in different ways than the Clade I variety responsible for ongoing outbreaks in Africa. Clade II continues to circulate at a low level in the U.S. The first case of Clade I mpox in the U.S. was reported in California in late 2024, followed by three more cases in 2025. None of the three had recently traveled outside the country, suggesting that local person-to-person community spread may be occurring. Although public health officials consider the likelihood of a widespread Clade I outbreak in the U.S. to be low, they urge people at higher risk to get two doses of the Jynneos vaccine. Unfortunately, findings from the STOMP trial showed that the antiviral drug tecovirimat (TPOXX) is not effective for Clade II mpox.

9. Metabolic Health

As HIV treatment has improved, attention has turned to managing coexisting conditions and comorbidities in the aging HIV population. Cardiovascular disease and cancer are now among the leading causes of death for people with HIV, who appear to be at risk at younger ages. Linked to obesity and other metabolic abnormalities, fatty liver disease—now renamed metabolic dysfunction-associated steatotic liver disease (MASLD)—has surged in recent years, and HIV-positive people may be even more susceptible than the population at large. Over time, MASLD can lead to cirrhosis and liver cancer. In the latest update its Guidelines for the Use of Antiretroviral Agents in Adults and Adolescents With HIV, the Department of Health and Human Services has added a new chapter on cardiovascular and metabolic health. And don't forget your shingles vaccine: A new study shows it can lower the risk for heart disease, dementia and death in addition to painful skin outbreaks.

10. Weight-Loss Meds

The general health news that probably got the most headlines in 2025 is the growing use of weight-loss medications, commonly known as GLP-1 receptor agonists. About one in five adults have used drugs such as semaglutide (Ozempic or Wegovy) or tirzepatide (Mounjaro or Zepbound), and this number will likely rise with the advent of new oral meds and lower prices on

the horizon. Originally developed for type 2 diabetes, studies have shown that the drugs not only curb “food noise” and promote weight loss, they also lower the risk of heart, kidney and liver disease (Wegovy was approved this year for MASLD), reduce the incidence of obesity-related cancers, improve sleep apnea and arthritis and may have beneficial anti-inflammatory effects. Although research is still limited, these medications appear to work well for people living with HIV, including improving cardiovascular biomarkers and potentially boosting cognition and slowing aging.

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