

# Study shows no increased risk for heart attacks among HIV-positive patients with high CD4 cell count

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Patients who are HIV-positive and have high CD4 cell counts—or have a high number of white blood cells that fight infections—aren't at an increased risk for heart attacks compared to patients who are HIV-negative, according to a Kaiser Permanente study that appears in the current online issue of the *Journal of Acquired Immune Deficiency Syndromes*.

The study population included 22,081 HIV-positive and 230,069 demographically matched HIV-negative subjects from Kaiser Permanente Northern California (1996-2009) and Kaiser Permanente Southern California (2000-2009) health plan members. Researchers determined that individuals with lowest-recorded CD4 cell counts of 500 or more had no greater risk of a [heart attack](#) than HIV-negative subjects. A CD4 cell count below 500 cells per microliter is considered a sign of a weakened immune system.

"We found that HIV-positive patients with a history of very low CD4 cell counts of 200 or below had a 74 percent higher risk for a heart attack compared with HIV-negatives, while those who maintained a CD4 cell count of 500 or more had the same risk compared with HIV-negatives," said lead author Michael J. Silverberg, PhD, MPH, a senior research scientist with the Division of Research and director of the Kaiser Permanente Northern California HIV Registry, which includes all known cases of HIV infection within the health care system dating back to the start of the HIV/AIDS epidemic.

In recent years, as widespread use of more effective antiretroviral medications has resulted in an aging HIV-infected population, it has become important to document whether age-related diseases, such as heart attacks, are occurring at similar or higher rates than the [general population](#).

HIV-positive individuals are known to have higher risk of heart attacks because they are more likely to smoke and to smoke heavily compared to the general population. In addition, some HIV therapies may increase cholesterol levels and certain HIV drugs may have direct effects on plaque formation that increase the likelihood of a heart attack.

"It is biologically plausible that lowest recorded CD4 cell count acts as a risk factor for heart attack since atherosclerosis is considered a consequence of a chronic inflammation," said senior author Daniel B. Klein, MD, chief of infectious diseases for Kaiser Permanente Hayward-Fremont, who has treated HIV-infected individuals for more than 25 years and was among the first to describe the association between HIV and heart disease. "The strong observed association for lowest recorded CD4 [cell count](#) and myocardial infarction risk likely reflects the fact that it is a good surrogate for increased duration of immunosuppression and HIV-associated inflammation."

According to the researchers, these findings suggest that the higher heart attack risk in this population with a history of very low CD4 cell counts may not be easily reversible, even with effective antiretroviral therapy. The results support increased efforts to diagnose and treat HIV as early as possible before CD4 cell counts have declined significantly. Early initiation of antiretroviral therapy, if combined with aggressive cardiovascular disease risk-factor management such as smoking cessation, might result in a similar overall heart-attack risk for HIV-positive individuals compared with the general population.

This study is part of Kaiser Permanente's ongoing efforts to understand the impact of HIV. In August of this year, Kaiser Permanente released a study that found HIV-positive patients who miss at least

one medical office visit in the first year after their HIV diagnosis have a 71 percent [increased risk](#) of death in comparison with HIV-positive patients who did not miss office visits. And in January of this year, researchers found that HIV-positive patients have a higher incidence of nonmelanoma skin cancers.

Provided by Kaiser Permanente

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