# 5-drug HAART during Primary HIV Infection Leads to a Reduction of Proviral DNA Levels in Comparison to Levels Achievable during Chronic Infection

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## Background

The New Era Study is an ongoing, prospective 7-year clinical trial initiated in 2009 using multi drug class (MDC) HAART in patients (pts) with primary HIV infection (PHI, ≤2 Western blot bands) and in pts with chronic HIV-infection on suppressive PI-based HAART for ≥3 years without prior virologic failure (CHR). The primary objectives of the study were to halt residual viral replication in plasma and to achieve depletion of cell-associated HIV-DNA ('proviral DNA') as a step towards (functional) HIV cure.

## Methods

Eligibility criteria were CD4 nadir >200/µl, no history of AIDS and CCR5 tropism. PHI pts received MDC HAART including 2 NRTIs +1 PI +Maraviroc (MVC) +Raltegravir (RAL). In CHR pts, HAART was intensified with MVC+RAL. HIV-DNA in peripheral blood mononuclear cells (PBMC) was measured as described by the French ANRS group. Here we compare virologic and immunologic outcomes after 24 months on MDC HAART in PHI and CHR pts.

## Results

In total, 20 CHR and 22 PHI pts were included. PHI pts were started on MDC HAART within ≤2.6 weeks after diagnosis. Western blot was negative in 12 PHI pts. By month 24, cell-associated HIV-DNA had decreased significantly in PHI pts (median: -1.4 log cp/$10^6$ PBMC, $p < 0.001$) but not in CHR pts (median: +0.2 log cp/$10^6$ PBMC). At month 24, median proviral DNA levels were significantly lower in PHI pts (2.1 vs. 2.6 log cp/$10^6$ PBMC, $p=0.001$). The slopes of cell-associated-HIV-DNA are shown in the figure. After 24 months, significantly more PHI pts had a CD4/CD8-ratio ≥1 (90% vs. 35%, $p=0.001$). Proportions of activated CD38+ CD8+cells were comparable between groups (median levels: 13% vs. 13%, p=n.s.).

## Conclusion

PHI patients receiving early treatment with multi drug class HAART achieved lower cell-associated HIV-DNA levels and a better immune reconstitution than chronically infected patients on intensified long-term suppressive HAART.