

# Initiation of HAART at CD4+ Cell Counts $\geq 350$ cells/mm<sup>3</sup> is Associated with a Lower Prevalence of Antiretroviral Resistance Mutations at Virologic Failure in the HIV Outpatient (HOPS) Cohort

#WEPEB017

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**Objective:** Determine prevalence of antiretroviral (ARV) drug resistance according to the CD4 cell count at which HAART was initiated among persons failing treatment.

**Methods:** We examined data from participants in the HOPS, a prospective observational cohort of HIV-infected patients seen at ten HIV specialty clinics in the United States. We included antiretroviral-naïve patients enrolled after January 1, 1999 (when genotypic HIV resistance testing [GT] became generally available) whose viral load (VL) was suppressed (<1000 copies/mL) following initiation of HAART. We analyzed the subsets of patients who experienced virologic failure (VL >1,000 copies/mL) who did and did not have GT performed. Among patients who had a genotype test performed at or after virologic failure, we assessed the prevalence of major resistance mutations (IAS-USA, 2006) at first GT stratified by the CD4 cell count at which HAART was initiated. Two-sided p-values for trend were calculated with the Cochran-Armitage Exact Test (SAS 9.0).

**Results:** Among 8,224 patients with evaluable data, 683 met entry criteria and achieved viral suppression. Of these, 243 experienced virologic failure: 165 without a GT and 78 with a GT at or after viral failure. Patients initiating at CD4 cell counts <200 cells/mm<sup>3</sup> had a higher prevalence of resistance, were older, had higher baseline VL, and were more likely to have been treated with protease inhibitors.

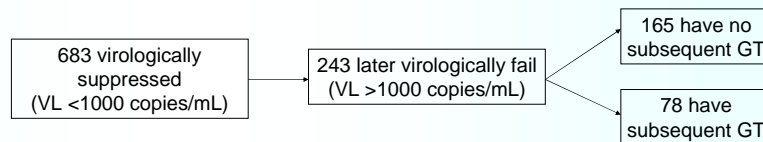
## Conclusions:

Patients who initiated HAART at CD4 cell counts  $\geq 350$  cells/mm<sup>3</sup> were half as likely to develop any major resistance mutation than patients who started at <200 cells/mm<sup>3</sup> despite a 2-fold greater exposure to ARVs at time of virologic failure. The prevalence of NRTI and NNRTI resistance mutations was almost five-fold different between patients in these two CD4 strata. Although our analyses were limited by small sample size, the same trends were seen in all ARV classes.

**Acknowledgements:** The authors thank the staff and thousands of HOPS subjects across the United States for their continued support and participation in the study.

## Patient Selection Procedures

1. Patients in the 3Q2006 HOPS dataset: (N = 8224)
2. ...and started their first ARV regimen that was HAART in 1999 or later: (N = 1732)
3. ...and have 2+ HOPS visits (N = 1648)
4. ...and have 90+ days of HAART experience (N = 1600)
5. ...and have complete documented ARV history: (N = 1093)
6. ...and entered HOPS before starting any 2nd HAART regimen: (N = 760)
7. ...and who had a viral load <1000 copies/mL after HAART-start: (N = 683)
8. ...and had a viral load test >1000 copies/mL after the prior viral load test <1000 copies/mL: (N = 243)
9. ...and who had a genotype test done at or after the viral load test >1000 copies/mL (N=78).

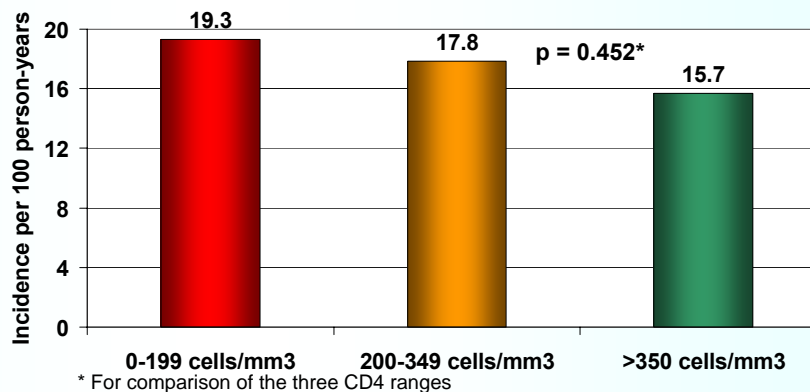


## Patient Characteristics at Baseline

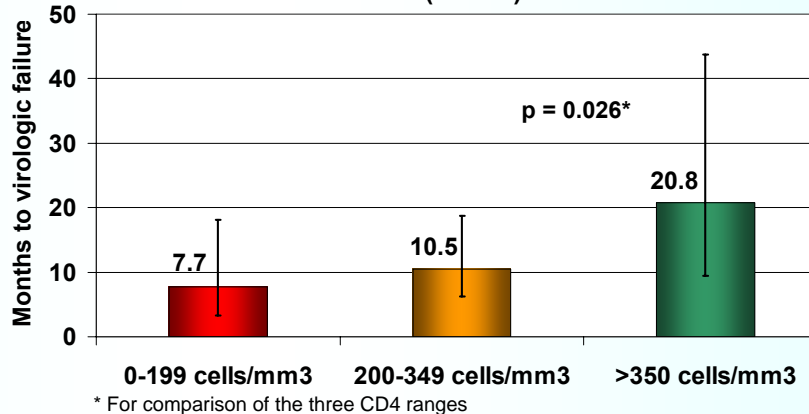
Baseline Characteristic	Maintained viral load <1000 copies/mL after HAART-start (N = 440)	Viral load test >1000 copies/mL but no genotype test after the prior viral load test <1000 copies/mL (N = 165)	Genotype test done at or after the viral load test >1000 copies/mL (N = 78)
Age in years (IQR)*	39 (33-44)	38 (31-44)	37 (29-44)
Sex, Male (%)	354 (80.5%)	120 (72.7%)	60 (76.9%)
Race/ethnicity			
White, non Hispanic (%)	264 (60.0%)	76 (46.1%)	26 (33.3%)
Black, non Hispanic (%)	132 (30.0%)	69 (41.8%)	47 (60.3%)
Hispanic (%)	10 (2.3%)	6 (3.6%)	0 (0.0%)
Other race (%)	34 (7.7%)	14 (8.5%)	5 (6.4%)
HIV risk factor (can have > 1 risk factor)			
MSM** (%)	274 (62.3%)	79 (47.9%)	33 (42.3%)
IDU† (%)	27 (6.1%)	13 (7.8%)	13 (16.7%)
High risk heterosexual (%)	139 (31.6%)	73 (44.2%)	36 (46.2%)
CD4 cell count, median (IQR)	236.5 (76.5-375.5)	256 (94-400)	155 (47-328)
Log viral load, median (IQR)	4.9 (4.3-5.4), N = 411	4.8 (4.1-5.3), N = 156	4.9 (4.3-5.4), N = 68
Insurance			
Private (%)	472 (69.1%)	108 (65.4%)	40 (48.7%)
Public (%)	211 (30.9%)	57 (34.6%)	38 (51.3%)
AIDS diagnosis (%)	215 (48.9%)	79 (47.9%)	50 (64.1%)
Year of HOPS entry			
1999-2002 (%)	216 (49.1%)	122 (73.9%)	56 (71.8%)
2003-2006 (%)	224 (50.9%)	43 (26.1%)	22 (28.2%)
Year started HAART			
1999-2002 (%)	244 (55.4%)	130 (78.8%)	67 (85.9%)
2003-2006 (%)	196 (44.6%)	35 (21.2%)	11 (14.1%)

\* Age at baseline CD4 \*\*Men who have sex with men †Intravenous drug user

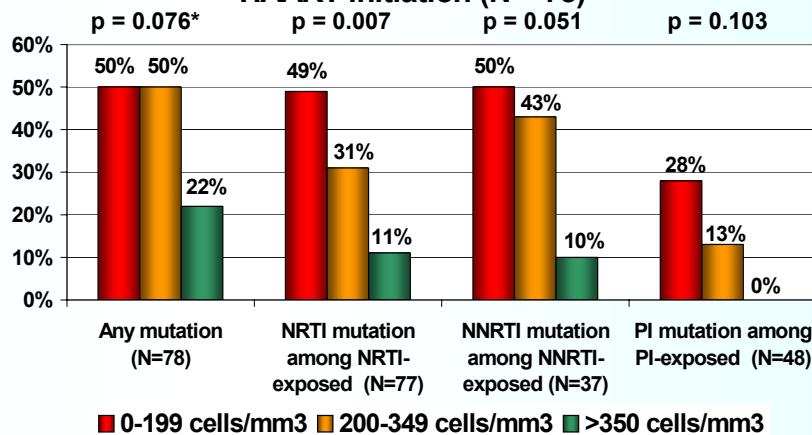
## Incidence of virologic failure after successful suppression on HAART, by CD4 count at HAART initiation (N = 683)



## Median months to virologic failure after successful suppression on HAART, by CD4 count at HAART initiation (N = 78)



## Prevalence of genotype mutations among persons with virologic failure after successful suppression on HAART, by CD4 cell count at HAART initiation (N = 78)



The findings and conclusions from this presentation are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

