

**To Investigate CD4 levels in patients with first breaks in continuity of taking  
Antiretroviral therapy and their determinants  
at the largest HIV clinic in Johannesburg, South Africa 2004-2008**

**By**

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in partial fulfillment of the requirements for the degree of  
Master of Science in Medicine in the field of Epidemiology and Biostatistics**

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## DECLARATION

I, Soka Nyirenda, hereby declare that this research report is my own work, and that I am submitting it for the award of the degree of Master of Science in Medicine in the field of Epidemiology with Biostatistics of the School of Public Health, of the Faculty of Health Sciences, of the University of the Witwatersrand-Johannesburg. This report has never been submitted for any other degree award or examination at this or any other University.



Signed:.....

29<sup>th</sup> day of March, 2011

*Dedicated to Joyce (my wife), Wiza, Duba and Chilambwe (my children)*

You are the best there ever was!

## ABSTRACT

**Introduction:** This study is a secondary data analysis of HIV/AIDS patients on Anti-retroviral Therapy (ART), at *Themba Lethu* HIV/AIDS clinic, who have had the first break in the continuity of taking their Antiretrovirals (ARVs) of more than 10 days, measured by patient missing the refill appointment for more than 10 days. The clinic started in 2004. HIV/AIDS is high in South Africa with about 400,000 AIDS patients on ARVs. For ARVs to be most effective they must be taken continuously without breaks, and for life. Without this, there is risk of ARVs drug resistance development and consequent failure of the ART program. Some patients may break this continuity and this seems to be a problem in South Africa. Where the patients develops side-effects or is not responding well to treatment, clinicians may also cause a break in the therapy. This study described the first break as *when* it occurred and for *how long* it lasted, investigated the factors associated with this break and the association of the first break and the last CD4 count.

**Materials and methods:** 7,930 adults ( $\geq 18$  years, either gender) on ART and baseline CD4  $< 250$  cells/ $\mu\text{l}$  were included in the study. The study group were patients who had first break in continuity of therapy of more than 10 days. The first break was described as *when* it occurred after months of ART initiation and *how long*(days) the first break lasted. Patients on Post- Exposure Prophylaxis, single-dose Nevirapine, Prevention-of mother-To-Child- transmission therapy, and those with breaks in therapy of more than 364 days were excluded. Outcome variables was the last CD4 count. Analyses were in STATA 10, at 95% confidence interval. Median and quartile ranges were used to describe participants in the study. T-test, Fishers exact test and chi-square were used to compare groups. Regression was used to determine demographic and clinical factors associated with first break in therapy and also to determine the association of first break in therapy and the last CD4 count.

**Results:** The median duration on ART for the patients was 764 days. 63% of patients had a break in ART. 47.5% of patients had their first break in therapy

within the first 2 years of being on the ART program, with the largest proportion within the first 6 months of therapy. Most patient came with advanced disease(CD4 <100cells/ $\mu$ l, WHO clinical staging IV). Women were twice more than men. They tended to come earlier for therapy, took longer to improve and delayed in having the first break compared to men (254 vs. 205 days). Baseline hemoglobin and unemployment were factors associated with *when* the first break occurred. The median length of first break was 21 (Q1-Q3 7-43) Unemployment and baseline hemoglobin were associated with length of first break. The first break in therapy was associated with the last CD4 count. The longer the patient stayed on ART without the first break, the higher the last CD4 would be. Peripheral neuropathy had a statistically significant positive association with the last CD4 count. However, baseline CD4, Age, baseline BMI, WHO stage IV, baseline hemoglobin and unemployment had a statistically significant but negative association with the last CD4 count. The weakness of using the missing appointment system is that it does not inform clinician whether patients is really taking or not taking ARVs at home. Its strength over the self reported adherence system is that it is free of recall bias.

**Conclusion:** Though Themba Lethu clinic has a follow-up system in place for patients missing refill appointment, up to 63% patient missed their appointment to collect medicine on time and this had a negative effect on the last CD4. There is need to strengthen existing follow-up method besides decentralising the ART services in Johannesburg.

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## DEFINITIONS

**ART:** Antiretroviral Therapy

**ARVs:** Antiretrovirals; Medicines used to treat HIV/AIDS

**Last CD4:** The CD4 which was recorded just before data was abstracted

**Break:** This is period, in days, from the time the ARVs were interrupted for more than 10 days, for any reason, to the time the patient resumes taking ARV

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