Gary Reiter  1955-2003

Andy Kaplan  1959-2006

Rob Malow  1953-2013
(My) Turning Points in HIV Treatment Adherence Research

David Bangsberg, MD, MPH

Director
Massachusetts General Hospital Center for Global Health

Professor
Harvard Medical School

Professor
Harvard School of Public Health

Visiting Professor
Mbarara University of Science and Technology
My Turning Points

1992 Missed the first ART adherence study for over 10 years
Compliance With Zidovudine Therapy in Patients Infected With Human Immunodeficiency Virus, Type 1: A Cross-Sectional Study in a Municipal Hospital Clinic*

JEFFREY H. SAMET, M.D., HOWARD LIEBER, M.D., KATHLEEN A. STIEGER, R.N., M.P.H.,
RAJDEV K. DHAWAN, Ph.D., JOHN CHIN, M.D., AMY H. SHEVITZ, M.D.,
REBECCA DREWIEK-DUNK, R.N.; SUZETTE EVANS, N.P.H.,
DONALD KUFFE, M.D., DONALD E. CRAVEN, M.D., BOSTON, MASSACHUSETTS
ART Adherence Publications by Year
My Turning Points

- 1992 Missed the first ART adherence study for over 10 years
- 1995 Back to basics
“In sum, a well designed study and important contribution to the field of nosocomial transmission of TB, but I strongly recommend that the author find an editor whose first language is English.”

Anonymous reviewer
“He or she is right. Your prose is tortured. Let’s start with a simple sentence and progress toward a comprehensible paragraph.”

Andrew Moss, PhD
My Turning Points

- 1992 Missed the first ART adherence study for over 10 years
- 1995 Back to basics
- 1996 Hope and fear
Doctors Withhold H.I.V. Pill Regimen From Some

Failure to Follow Rigid Schedule Could Hurt Others, They Fear

By DEBORAH SONTAG and LYNDA RICHARDSON

Tyeshia Ross, an 18-year-old who has H.I.V., is street smart but childishly innocent. She does not understand the full import of the virus that she carries, believing that it requires only a "minor adjustment" in her everyday life. So she often misses doctor’s appointments and fails to take medications.

Through her Medicaid coverage, Ms. Ross, who lives in the Bronx, can afford the costly new drugs that might halt her progress toward AIDS. But her doctor will not prescribe them to her. She does not think that Ms. Ross can handle a complex drug-taking regimen, in which missing doses could have serious consequences, making her virus resistant to future treatment.

"I don't trust her ability to stick to a schedule," said Dr. Jeanne Carey, a physician at Beth Israel Medical Center's H.I.V. clinic in Manhattan.

With the early successes of drug cocktails built on a new class of drugs called protease inhibitors, national concern has focused on whether their high cost puts them out of the reach of many AIDS patients. But in New York State, which has the most comprehensive drug assistance program in the nation, everyone is covered for the new AIDS drugs. But not everyone can get them. And cost is not the deciding factor; doctors are. Since the exacting regimens...
Patient Compliance and Drug Failure in Protease Inhibitor Monotherapy
Geertrui F. Vanhove, MD, PhD; Jonathan M. Schapiro, MD; Mark A. Winters, MSc; Thomas C. Merigan, MD; Terrence F. Blaschke, MD

Patient Compliance and Drug Failure in Protease Inhibitor Monotherapy

To the Editor—We conducted a 3-dose study of saquinavir in patients with human immunodeficiency virus type 1 (HIV-1) positive patients receiving either three or six 800-mg capsules of saquinavir (Roche Products, Welwyn, United Kingdom) 4 times daily (total dose, 2400 mg/d or 3600 mg/d). Analysis of data from 35 patients revealed that the duration of the response was measured by HIV-1 plasma RNA copy number variation within the 3 groups. The variation was not accounted for by the development of resistant mutations alone.

To investigate whether decreased patient compliance with the intensive regimen could explain the observed variations in viral responses, we monitored drug-taking behavior in the remaining patients on their enrollment into the high-dose group for the initial 24 weeks of therapy using medication container closures or caps that record precise date and time of opening and closing of the container on a microprocessor and send weekly back to a central database and analyzed. Plasma samples were assayed for HIV-1 plasma RNA copy number (by polymerase chain reaction assay) and mutations on a monthly basis.

The actual number of medication doses taken per day together with log plasma RNA copy number vs time and the presence of mutations were then as shown in the Figure. Patients 1 and 2 were initially compliant and their viral load decreased promptly. When they took a 3-day drug holiday (defined as a period of 5 or more days of taking very little or no medication), plasma HIV RNA levels increased in close proximity to the holiday. Shortly after these patients began taking their medication regularly again, plasma HIV RNA levels decreased. The second increase in plasma RNA levels toward the end of the study, despite good compliance, might be explained at least in part by the development of a mutation between weeks 20 and 24. Patients 1, 6, and 7 were also noncompliant in the beginning of the study, and their viral loads decreased. When, toward the end of the study, compliance decreased in 2 of 3 patients (patients 4 and 6), plasma RNA levels increased subsequently. These patients developed no mutations before 24 weeks. Patient 6 developed a mutation that may have been the cause of the subsequent increase in plasma RNA levels.
Patient Compliance and Drug Failure in Protease Inhibitor Monotherapy
Geertrui F. Vanhove, MD, PhD; Jonathan M. Schapiro, MD; Mark A. Winters, MSc; Thomas C. Merigan, MD; Terrence F. Blaschke, MD

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Å 1996 Hope and fear
Å 1999-2000 The 95% rule
1999: Adherence and Viral Suppression

Percentage of adherence correlates with the risk of protease inhibitor (PI) treatment failure in HIV-infected patients
Jose L. Casado, Raquel Sabido, María J. Pérez-Elías, Antonio Antela, Jesús Oliva, Fernando Dronda, Blanca Mejía, and Jesús Fortún

The value of patient-reported adherence to antiretroviral therapy in predicting virologic and immunologic response
Richard H. Haubrich, Susan J. Little, Judith S. Currier, Donald N. Forthal, Carol A. Kemper, Gildon N. Beall, Debra Johnson, Michael P. Dubé, Jimmy Y. Hwang, J. Allen McCutchan, and the California Collaborative Treatment Group

Disease Progression, Adherence, and Response to Protease Inhibitor Therapy for HIV Infection in an Urban Veterans Affairs Medical Center
Kevin Maher, N. Klimas, M. A. Fletcher, V. Cohers, M. M. Maggio, T. J. Triplet, R. Valenzuela, and G. Dickinson

Incidence and Predictors of Virologic Failure of Antiretroviral Triple-Drug Therapy in a Community-Based Cohort
2000: Objectives Measures Cement the Relationship

Adherence to protease inhibitors, HIV-1 viral load, and development of drug resistance in an indigent population
David R. Bangsberg, Frederick M. Hecht, Edwin D. Charlebois, Andrew R. Zolopa, Mark Holodniy, Lewis Sheiner, Joshua D. Bamberger, Margaret A. Chesney and Andrew Moss

Adherence to Protease Inhibitor Therapy and Outcomes in Patients with HIV Infection
David L. Paterson, MB, BS, FRACP; Susan Swindells, MD; Jeffrey Mohr, MSW; Michelle Brester, RN; Emanuel N. Vergis, MD; Cheryl Squier, RN; Marilyn M. Wagener, MPH; and Nina Singh, MD

Antiretroviral Therapy Adherence and Viral Suppression in HIV-Infected Drug Users: Comparison of Self-Report and Electronic Monitoring
Adherence to protease inhibitors, HIV-1 viral load, and development of drug resistance in an indigent

David R. Bangsberg, Jr., Andrew R. Zolopa, Joshua D. Bamberger

Fig. 2. Drug resistance by adherence and viral suppression.
2000: Objectives Measures Cement the Relationship


Figure 1. Adherence to antiretroviral therapy and virologic failure.

The degree of adherence was significantly associated with risk for virologic failure ($P < 0.001$). Adherence of 95% or greater was associated with the lowest incidence of virologic failure.
2000: Objectives Measures Cement the Relationship

Figure 1. Subjects were categorized by quartile of electronic monitoring (MEMS) adherence: (1) <20%, (2) 20%–49%, (3) 50%–89%, and (4) ≥90%. Among the 22 subjects with a virus load of <500 copies/mL, the number and percentage in each quartile by both MEMS and self-reported adherence are indicated.

Antiretroviral Therapy Adherence and Viral Suppression in HIV-Infected Drug Users: Comparison of Self-Report and Electronic Monitoring

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Bell-shaped Adherence and Resistance Curve

Increasing probability of selecting mutation

Inadequate Drug Pressure To Select Resistant Virus

Drug Pressure Selects Resistant Virus

Complete Viral Suppression

Increasing Adherence
Resistance is Complicated


Resistance is Complicated


Resistance is Complicated


Resistance is Complicated


Resistance is Complicated

Paradoxes of adherence and drug resistance to HIV antiretroviral therapy
David R. Bangsberg, Andrew R. Moss and Steven G. Deeks

Advance Access published March 24, 2004

Effect of Adherence to HAART on Virologic Outcome and on the Selection of Resistance-Conferring Mutations in NNRTI- or PI-Treated Patients
Franco Maggiolo, Monica Airoldi, Hendrik Daniël Kleinloog, Annapaola Callegaro, Veronica Ravasio, Claudio Arici, Enrico Bombana, and Fredy Suter

Figure 4. Adherence rate and risk of selecting for resistance-inducing viral mutations. Rate of rebound adjusted analysis. NNRTI = non-nucleoside reverse transcriptase inhibitor; PI = protease inhibitor.
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- 2008 Letting go of 95%
- 2008-2012 Dynamics and patterns matter
- 2000-2008 Remembering what we forgot
- 2009 Adherence is more than pill taking
- 2000-2013 Interventions work – but for whom and how long?
- 2008 Behavioral detection of treatment failure
- 2010 Doing it in real time
- 2012 Adherence to prevention
[In sub-Saharan Africa]....the potential short term gains from reducing individual morbidity and mortality may be far outweighed by the potential for the long term spread of drug resistance.... In Africa, a higher proportion of patients are likely to fall into the category of potential poor adherers unless resource intensive adherence programmes are available.
Africans Outdo U.S. Patients in Following AIDS Therapy

By DONALD G. MCNEIL JR.

Contradicting long-held prejudices in Europe are resistant to at least one drug.

For Africa, the issue is particular-
Africans Outdo U.S. Patients In Following AIDS Therapy

By DONALD G. McNEIL Jr.

Adherence to Antiretroviral Therapy in Sub-Saharan Africa and North America
A Meta-analysis

Edward J. Mills, PhD, MS
Jean B. Nardeau, MD, MPH
Iain Buchanan, MD, FFPH
James Orbinski, MD, MA
Amir Attaran, DPhil, LLB
Sonal Singh, MD
Bela Bhadelia, BSc
Ping Wu, MBBS, MS
Curtis Cooper, MD, MS
Lobesa Thahane, PhD, MS
Kumaran Wilson, MD, MSc
Gordon H. Guyatt, MD, MSc
David R. Bangsberg, MD, MPH

Context Adherence to antiretroviral therapy is a powerful predictor of survival for individuals living with human immunodeficiency virus (HIV) and AIDS. Concerns about incomplete adherence among patients living in poverty have been an important consideration in expanding the access to antiretroviral therapy in sub-Saharan Africa.

Objective To evaluate estimates of antiretroviral therapy adherence in sub-Saharan Africa and North America.

Data Sources Eleven electronic databases were searched along with major conference abstract databases. Inclusion dates: inception of database up until April 18, 2006 for all English-language articles and abstracts, and researchers and treatment advocacy groups were contacted.

Study Selection and Data Abstraction To best reflect the general population, studies of mixed populations in both North America and Africa were selected. Studies evaluating specific populations such as men only, homeless individuals, or drug users were excluded. The data were abstracted in duplicate on study adherence outcomes, thresholds used to determine adherence, and characteristics of the populations. A random-effects meta-analysis was performed, in which heterogeneity was examined using multiplicative random-effects variance estimation. A probabilistic analysis was performed...
Africans Outdo U.S. Patients In Following AIDS Therapy

By DONALD G. MCNEIL JR.

Adherence to Antiretroviral Therapy in Sub-Saharan Africa and North America: A Meta-analysis

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Ping Wu, MBBS, MSc
Gutta Cooper, MD, MSc
Lehana Thabane, PhD, MSc
Kumaran Wilson, MD, MSc
Gordon H. Guyatt, MD, MSc
David R. Bangsberg, MD, MPH

Annals of Internal Medicine

Adherence to Nonnucleoside Reverse Transcriptase Inhibitor–Based HIV Therapy and Virologic Outcomes

Jean B. Nachega, MD, MPH; Michael Hislop, MSc; David W. Dowdy, ScM; Richard E. Chaisson, MD; Leon Regensberg, MBChB; and Gary Maartens, MBChB

Epidemiology and Social Science

Adherence to Highly Active Antiretroviral Therapy Assessed by Pharmacy Claims Predicts Survival in HIV-Infected South African Adults

Jean B. Nachega, MD, MPH,* Michael Hislop, MSc,† David W. Dowdy, ScM,‡ Melanie Lo, MHS,* Saad B. Omer, MBBS, MPH,* Leon Regensberg, MBChB, MRCP,† Richard E. Chaisson, MD,‡ and Gary Maartens, MBChB, FCP||
Africans Outdo U.S. Patients In Following AIDS Therapy

By DONALD G. McNEIL Jr.

Adherence to Antiretroviral Therapy in Sub-Saharan Africa and North America: A Meta-analysis

Context: Adherence to antiretroviral therapy is a powerful predictor of survival for individuals living with human immunodeficiency virus (HIV) and AIDS. Concerns about incomplete adherence among patients living in poverty have been an important consideration in expanding the access to antiretroviral therapy in Sub-Saharan Africa.

Annals of Internal Medicine

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Explaining Adherence Success in Sub-Saharan Africa: An Ethnographic Study

Norma C. Ware†, John Idoko†, Sylvia Kaaya‡, Irene Andia Biraro‡, Monique A. Wyatt‡, Oche Agbaji‡, Guerino Chalamilla†,§, David R. Bangsberg†,§,∥
My Turning Points

- 1992 Missed the first ART adherence study for over 10 years
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- 2004 Doom and gloom
- 2008 Letting go of 95% rule
Letting go of “The 95% rule”

BRIEF REPORT HIV/AIDS

Less Than 95% Adherence to Nonnucleoside Reverse-Transcriptase Inhibitor Therapy Can Lead to Viral Suppression

David R. Bangsberg

Rapid Communication

HIV-Infected Patients Receiving Lopinavir/Ritonavir-Based Antiretroviral Therapy Achieve High Rates of Virologic Suppression Despite Adherence Rates Less Than 95%

Jonathan Shuter, MD,*† Julie A. Sarlo, PA,* Tina J. Kannaz, PharmD,‡ Richard A. Rode, PhD,* and Barry S. Zingman, MD**†

Concise Communication

A single tablet regimen is associated with higher adherence and viral suppression than multiple tablet regimens in HIV+ homeless and marginally housed people

David R. Bangsberg*a, Kathleen Raglandb, Alex Monkb and Steven G. Deeksb
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• 2008 Letting go of 95% rule
• 2007-2012 Dynamic adherence-VL and patterns matter
Dynamic Adherence-VL Relationships

The Risk of Virologic Failure Decreases with Duration of HIV Suppression, at Greater than 50% Adherence to Antiretroviral Therapy

Michael Rosenblum¹, Steven G. Deeks¹, Mark van der Laan², David R. Bangsberg³*

Published in final edited form as:

Risk of Viral Failure Declines with Duration of Suppression on HAART, Irrespective of Adherence Level

Viviane D. Lima¹,², David R. Bangsberg³, P. Richard Harrigan¹,², Steven G. Deeks⁴, Benita Yip¹, Robert S. Hogg¹,⁵, and Julio S.G. Montaner¹,²

Increased duration of viral suppression is associated with lower viral rebound rates in patients with previous treatment failures

Andrew A. Benzie⁶, Loveleen K. Bans⁷, Caroline A. Sabin⁷, Simon Portsmouth⁸, Teresa Hill⁹, Margaret Johnson⁹, Richard Gilson⁹, Philippa Easterbrook⁶, Brian Gazzard⁶, Martin Fisher⁶, Chloe Orkin⁶, David Dunn⁹, Valerie Delpech⁹, Graham P. Taylor⁹, John C. Walsh⁹, and Andrew N. Phillips⁶ on behalf of the United Kingdom Collaborative HIV Cohort (CHIC) Study
Patterns Matter

Treatment interruptions predict resistance in HIV-positive individuals purchasing fixed-dose combination antiretroviral therapy in Kampala, Uganda

Jessica H. Oyugi, Jayne Byakika-Tusiime, Kathleen Ragland, Oliver Laeyendecker, Roy Mugerwa, Cissy Kityo, Peter Mugaenyi, Thomas C. Quinn and David R. Bangsberg

Not All Missed Doses Are the Same: Sustained NNRTI Treatment Interruptions Predict HIV Rebound at Low-to-Moderate Adherence Levels

Jean-Jacques Parienti, Moupali Das-Douglas, Véronique Massari, David Guzman, Steven G. Deeks, Renaud Verdon, David R. Bangsberg

Patterns of antiretroviral therapy adherence and impact on HIV RNA among patients in North America

Becky L. Genberg, Ira B. Wilson, David R. Bangsberg, Julia Arsten, Kathy Goggin, Robert H. Remien, Jane Simoni, Robert Gross, Nancy Reynolds, Marc Rosen, Honghu Liu, for the MACH14 Investigators
My Turning Points

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Remembering What We Forgot
Remembering What We Forgot

Self-reported adherence to antiretroviral medications among participants in HIV clinical trials: the AACTG Adherence Ir

BRIEF REPORTS

Adherence to Antiretroviral Therapy Assessed by Unannounced Pill Counts Conducted by Telephone

Seth C. Kalichman, PhD1, Christina M. Amaral, BA2, Heidi Stearns, BA2, Denise White, BA2, Jody Flanagan, BA2, Howard Pope, BS2, Chauncey Cherry, MPH2, Demetria Cain, MPH2, Lisa Eaton, BA2, and Moira O. Kalichman, MSW2

Diagnostic Value of Different Adherence Measures Using Electronic Monitoring and Virologic Failure as Reference Standards

Ann E. Deschamps, M.S.N.1, Herman Bobbie

Optimal Recall Period and Response Task for Self-Reported HIV Medication Adherence

Ming Li, Steven A. Safer, Paul R. Skolasky, William H. Rogers, William Cosdy, Helene Hardy, Ira B. Wilson
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- 2000-2008 Remembering what we forgot
- 2007-2011 Adherence is more than pill taking
Adherence is More than Pill Taking “The Cascade”
Adherence is More than Pill Taking
“The Cascade”
Hasan Baryahikiwa “The Ascertainer”
Employed by Elvin Geng in Mbarara Uganda
Sampling Based Approach

- Not all loss is bad (Geng, Plos One 2011)
- Disengagement is overestimated (Geng, Plos One 2011)
- Mortality is underestimated (Geng Jama 2008)
- Death between appts more common than death after missed appts (Geng, JAIDS 2010; Geng AJE 2012)
- Corrects mistaken risk factors (Geng, Trop Med Int Health 2010)
- Disengagement is erosion of a social bond between patient and clinic in face of structural barriers (Ware PLoS Med 2013)
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- 2007-2011 Adherence is more than pill taking
- 2000-2013 Interventions work – but for whom and how long?
Adherence Interventions Work
READ summary to quote several interventions
David Bangsberg, 5/20/2013
Adherence Interventions Can Be Delivered by Telephone

**Clinical Science**

*Telephone Support to Improve Antiretroviral Medication Adherence*

*A Multi.*

Nancy R. Reynolds, PhD,* M
Judith L. Nezef, PhD,* Is
and Gregory K. Robbins,

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**Original Investigation**

*Brief Behavioral Self-Regulation Counseling for HIV Treatment Adherence Delivered by Cell Phone: An Initial Test of Concept Trial*

Seth C. Kalichman, Ph.D., Moira O. Kalich
Connie Swetza, L.P.N., Christina M. Amaral, I
Tamar Grebler, B.A., a

**Mobile phone technologies improve adherence to antiretroviral treatment in a resource-limited setting: a randomized controlled trial of text message reminders**

Cristian Pop-Eleches, Harsha Thirumurthry, James P. Habyarimana, Joshua G. Zivin, Markus P. Goldstein.

Damien de Walque, Leslie M.
Sylvester Kimaiyo, John Sidl
David R. Bai

**Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): a randomised trial**

Joshua Kimani, Martha Aken, France A. Parnay

**The Cameroon Mobile Phone SMS (CAMPS) Trial: A Randomized Trial of Text Messaging versus Usual Care for Adherence to Antiretroviral Therapy**

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Pharmacy Refill Adherence Compared with CD4 Count Changes for Monitoring HIV-Infected Adults on Antiretroviral Therapy

Gregory P. Bisson¹,²*, Robert Gross¹,², Scarlett Bellamy³, Jesse Chittams², Michael Hislop³, Leon Regensberg³, Ian Frank¹, Gary Maartens⁴, Jean B. Nachega⁴,⁵,⁶*
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Real-time Adherence Monitoring
Haberer et al AIDS and Behavior 2010
Real-time Adherence Monitoring

Haberer et al. AIDS and Behavior 2010
Real-time Adherence Monitoring

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• 2012 Adherence to prevention
ART is Prevention

Prevention of HIV-1 Infection with Early Antiretroviral Therapy

Myron S. Cohen, M.D., Ying Q. Chen, Ph.D., Marybeth McCauley, M.P.H., Theresa Gamble, Ph.D.,
Mina C. Hosseinipour, M.D., Nagalingeswaram Kumarasamy, M.B., B.S., James G. Hakim, M.D.,
Johnstone Kumwenda, F.R.C.P., Beatriz Grinsztejn, M.D., Jose H.S. Pilloto, M.D., Sheela V. Godbole, M.D.,
Sanjay Mehendale, M.D., Suwat Charialertsak, M.D., Breno R. Santos, M.D., Kenneth H. Mayer, M.D.,
Irving F. Hoffman, P.A., Susan H. Eshleman, M.D., Estelle Piwowar-Manning, M.T., Lei Wang, Ph.D.,
Joseph Makhema, F.R.C.P., Lisa A. Mills, M.D., Guy de Bruyn, M.B., B.Ch., Ian Sanne, M.B., B.Ch.,
Joseph Eron, M.D., Joel Gallant, M.D., Diane Havir, M.D., Susan Swindells, M.B., B.S., Heather Ribaudo, Ph.D.,
Vanessa Elharrar, M.D., David Burns, M.D., Taha E. Taha, M.B., B.S., Karin Nielsen-Saines, M.D.,
David Celentano, Sc.D., Max Essex, D.V.M., and Thomas R. Fleming, Ph.D., for the HPTN 052 Study Team
ART is Prevention

 Prevention of HIV-1 Infection with Early Antiretroviral Therapy

 Myron S. Cohen, M.D., Ying Q. Chen, Ph.D., Marybeth McCauley, M.P.H., Theresa Gamble, Ph.D.,
 Mina C. Hosseinipour, M.D., Nagalingeswaran Kumarasamy, M.B., B.S., James G. Hakim, M.D.,
 Johnstone Kuuwenda, F.R.C.P., Beatriz Grinsztejn, M.D., Jose H.S. Piloitto, M.D., Sheela V. Godbole, M.D.,
 Sanjay Mehendale, M.D., Suwat Chariyalertsak, M.D., Breno R. Santos, M.D., Kenneth H. Mayer, M.D.,
 Irving F. Hoffman, P.A., Susan H. Eshleman, M.D., Estelle Piwowar-Manning, M.T., Lei Wang, Ph.D.,
 Joseph Makwema, F.R.C.P., Lisa A. Mills, M.D., Guy de Bruyn, M.B., B.Ch., Ian Sanne, M.B., B.Ch.,
 Joseph Enon, M.D., Joel Gallant, M.D., Diane Havir, M.D., Susan Swindells, M.B., B.S., Heather Ribaudo, Ph.D.,
 Vanessa Elharrar, M.D., David Burns, M.D., Taha E. Taha, M.B., B.S., Karin Nielsen-Saines, M.D.,
 David Celentano, Sc.D., Max Essex, D.V.M., and Thomas R. Fleming, Ph.D., for the HPTN 052 Study Team*

 Brief Report: Clinical Science

 Higher Baseline CD4 Cell Count Predicts Treatment Interruptions and Persistent Viremia in Patients Initiating ARVs in Rural Uganda

 Susan A. Adakun, M.D.*, Mark J. Siedner, M.D., M.P.H.,† Conrad Muzoora, M.D.*,
 Jessica E. Haberer, M.D., M.S.,‡ Alexander C. Tsai, M.D.,§ Peter W. Hunt, M.D.,¶ Jeff N. Martin, M.D., M.P.H.,¶
 and David R. Bangsberg, M.D., M.P.H.*#
PrEP Adherence

**RESEARCH ARTICLES**

**CORRECTED 29 JULY 2011; SEE LAST**

**Effectiveness and Safety of Tenofovir Gel, an Antiretroviral Microbicide, for the Prevention of HIV Infection in Women**

Quarraisha Abdool Karim,1,2,3* Sopian S. Abdool Karim,1,2,3 Janet A. Frischlich,1 Ameke C. Grobler,1
Charityk Gante,2 Lisa E. Morrow,1 Ayenke B. M. Kharen,1 Geregetse Sibedu,1
Zaheen Omar1,1 Tarunja N. Nagielpit,1 Sira Na-Mannachai,1 Natascha Anjaparid,1 Mukteshwar Mitha1,2
Lynn Morris,1 Douglas Taylor,1 on behalf of the CAPRISA 004 Trial Group

**The NEW ENGLAND JOURNAL OF MEDICINE**

**DECEMBER 30, 2010**

**Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men**


**MTN**

**FOR IMMEDIATE RELEASE**

**THE VOICE**

**CONTACT:** Lisa Rosen  
+1-815-910-5315 (mobile) or  
+1-773-323-4097 (through 7 March)  
rsoros@mtninc.com

**Daily HIV prevention approaches didn’t work for African women in the VOICE Study**

Truvada found not an effective strategy in this population

**ATLANTA, March 4, 2013** – Results of a major HIV prevention trial suggest that daily use of a product — whether a vaginal gel or an oral tablet — does not appear to be the right approach for preventing HIV in young, serodiscordant African women.

**ORIGINAL ARTICLE**

**Antiretroviral Preexposure Prophylaxis for Heterosexual HIV Transmission in Botswana**

PrEP Adherence

What’s Love Got to Do With It? Explaining Adherence to Oral Antiretroviral Pre-Exposure Prophylaxis for HIV-Serodiscordant Couples

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Antiretroviral Preexposure Prophylaxis for Heterosexual HIV Transmission in Botswana


Preexposure Prophylaxis for HIV Infection among African Women

What's Love Got to Do With It?

Courtesy of Fran Priddy IAVI
Conclusions

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• Strong and data-less opinions about marginalized groups are low hanging fruit.
• Are we measuring the right thing in the right way at the right time?
• We should not Invest hundreds of millions of dollars to test drug efficacy *before* investing hundreds of thousands of dollars to understand whether people will take it.
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