Update in HIV Medicine for the Generalist

Society of General Internal Medicine
35th Annual Meeting
April 26th, 2013

E. Jennifer Edelman, Florence Momplaisir, James Sosman, Gail Berkenblit, Oni Blackstock, Lynn Fiellin, Joseph Cofrancesco, Amina Chaudhry

SGIM HIV/AIDS Interest Group
Lawrence S. Linn
HIV Research Grant

Provides grants to young investigators to study or improve the quality of life for persons with AIDS or HIV infection.

Proposal Title
“Safer Opioid Prescribing for HIV-infected Patients with Chronic Pain”

2013 Selection Committee
Amina A. Chaudhry, MD, MPH, Chair
Joseph Cofrancesco MD, MPH, FACP
James Sosman MD
Albert Wu MD, MPH, FACP
Gail Berkenblit MD, PhD

2013 Awardee
Joanna Starrels, MD, MS
Disclosures

• Faculty have no disclosures to report
Learning Objectives

1. Describe and appraise the most recent evidence on HIV prevention with a focus on recent guidelines on pre-exposure prophylaxis;

2. Understand the role of and barriers to implementing universal HIV testing;

3. Describe important considerations for the management of the newly diagnosed HIV-infected patient;

4. Recognize health disparities and age-related factors in HIV and consider the role of social determinants of health in the care and management of the HIV-infected patient.
Methodology

• Literature review of peer-reviewed studies relevant to the management of HIV for the generalist physician

• PUBMED Medical Subject Heading (MeSH) search limited to articles published on or after March 2012

• Review of published studies in the major peer-reviewed general medicine and HIV journals and important unpublished abstracts since March 2012

• Final articles were selected by group consensus of HIV experts and practicing clinicians
Agenda

• Pre-Exposure Prophylaxis – F. Momplaisir
• Testing and Linkage to Care – G. Berkenblit
• Newly Diagnosed HIV – E.J. Edelman
• Health Disparities and HIV – A. Chaudhry
CASE

• MH, a 24 year old African American male with no prior medical problems, presents to clinic asking for a prescription for “a new pill to prevent HIV infection.”

  – Who should you consider for PrEP?
  – What are the recent data on the efficacy of PrEP?
  – What do potential patients think about PrEP?
  – What are points you should consider before prescribing PrEP??
PRE-EXPOSURE PROPHYLAXIS
PrEP approval

• July 2012: FDA approved tenofovir-emtricitabine (TDF/FTC) for pre-exposure prophylaxis (PrEP)

• August 2012: CDC published interim guidance for clinicians considering the use of PrEP
VOICE

• Phase 2B, randomized, double-blind, placebo-controlled, five-arm trial of daily use of the following for prevention of HIV acquisition in women:
  - Vaginal tenofovir (TFV) 1% gel (40 mg)
  - Oral tenofovir (TDF, 300 mg)
  - Oral tenofovir / emtricitabine (TDF / FTC; 300 mg / 200 mg)
VOICE Design

5,029 HIV- women

Vaginal sex in prior 3 months
Not pregnant or breastfeeding
Willing to use effective contraception

Randomized to once daily use

- Oral TDF
- Oral FTC/TDF
- Oral Placebo
- Vaginal TFV
- Vaginal placebo

Monthly visits

Comprehensive HIV prevention counseling, condoms, contraception, pregnancy test, STI evaluation & treatment, provision of study product

1° endpoints: HIV infection, safety

- Screened: 12,320
- Enrolled: 5,029

- **UGANDA**: 322 participants
  - Makerere Univ./JHU, Kampala: 1 site

- **ZIMBABWE**: 630 participants
  - UZ-UCSF, Harare: 1 site
  - UZ-UCSF, Chitungwiza: 2 sites

- **SOUTH AFRICA**: 4,077 participants
  - Durban
    - Medical Research Council: 7 sites
    - CAPRISA eThekweni: 1 site
  - Johannesburg
    - WRHI: 1 site
    - PHRU Soweto: 1 site
  - Klerksdorp
    - Aurum Institute: 1 site
## Primary Efficacy Results (mITT)

<table>
<thead>
<tr>
<th></th>
<th>TDF*</th>
<th>Oral Placebo*</th>
<th>FTC/TDF</th>
<th>Oral Placebo</th>
<th>TFV Gel</th>
<th>Gel Placebo</th>
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</thead>
<tbody>
<tr>
<td>Person-years</td>
<td>823</td>
<td>837</td>
<td>1285</td>
<td>1306</td>
<td>1026</td>
<td>1030</td>
</tr>
<tr>
<td>No. of HIV infections</td>
<td>52</td>
<td>35</td>
<td>61</td>
<td>60</td>
<td>61</td>
<td>70</td>
</tr>
<tr>
<td>HIV incidence per 100 p-y</td>
<td>6.3  ((4.7, 8.3))</td>
<td>4.2 ((2.9, 5.8))</td>
<td>4.7 ((3.6, 6.1))</td>
<td>4.6 ((3.5, 5.9))</td>
<td>5.9 ((4.5, 7.6))</td>
<td>6.8 ((5.3, 8.6))</td>
</tr>
</tbody>
</table>

*Censored on date when sites were asked to take women off of TDF and TDF placebo pills*
Primary Efficacy Results

CROI 2013. Oral session 8, 26 LB, Marrazzo et al.
Plasma Tenofovir Detection in Random Cohort Sample

Level of TFV detection ≥ 0.3 ng / ml

CROI 2013. Oral session 8, 26 LB, Marrazzo et al.
## Summary of PrEP Trials

<table>
<thead>
<tr>
<th>Study</th>
<th>Effect size, % (95% CI)</th>
<th>% risk reduction with detectable plasma TDF</th>
</tr>
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<tbody>
<tr>
<td>Partners PrEP</td>
<td>73 (49-85)</td>
<td>90</td>
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<tr>
<td>TDF-2</td>
<td>63 (22-83)</td>
<td>84</td>
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<tr>
<td>iPrEX</td>
<td>42 (15-63)</td>
<td>92</td>
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<tr>
<td>CAPRISA</td>
<td>39 (6-60)</td>
<td>54</td>
</tr>
<tr>
<td>FEM-PrEP</td>
<td>0 (-69-41)</td>
<td>Not reported</td>
</tr>
</tbody>
</table>
ATTITUDES AND PROGRAM PREFERENCES OF AFRICAN-AMERICAN URBAN YOUNG ADULTS ABOUT PRE-EXPOSURE PROPHYLAXIS (PrEP)

Dawn K. Smith, Lauren Toledo, Donna Jo Smith, Mary Anne Adams, and Richard Rothenberg
Introduction

• In 2009, there were an estimated 48,100 new HIV infections, 61% were among MSM

• HIV incidence remained stable from 2006 to 2009, however, African-American (AA) MSM have experienced a significant increase in new HIV infections (48% among those aged 13-29)

• Limited data on the perceptions of PrEP among AA MSM

• Study aims: To evaluate the attitude about PrEP among young inner city AA men and women at risk for HIV infection
Methods

- Participants: age 18-24, recruited from zip codes with high HIV prevalence in Atlanta, GA

- 10 Focus Groups:
  - 8 groups - gender mixed
  - 2 groups - MSM only

- A general inductive approach was used to identify themes related to attitudes toward PrEP, themes were compared between groups
Results

Major Themes:

2. Potential facilitators to taking PrEP
3. Potential barriers to taking PrEP
4. Potential effects of PrEP on sexual risk-taking
5. Health care access
General Acceptance of PrEP

• The majority of participants reacted positively to the idea of taking PrEP and thought that it would be widely accepted in their community

• Quarterly visit for HIV testing was not perceived as a barrier. One MSM participant noted: “It’d be good because it’s good to know your status, especially if you’re sexually active.”
Facilitators

- Proximity of clinics or pharmacies to public transportation stops
- Availability in various types of health care settings (Health Department clinics, pharmacies, hospitals or hospital clinics)
- Mail order suggested with mixed reactions because of privacy concerns
Barriers

• Side effects

• Medication cost (not more than $25)

• Partial effectiveness: “I don’t really know, because if you take a 50% effective pill, you can still get it, there’s a 50% chance to...That’s 50/50, like, you still get it.”

• Low perceived risk: “See, I’m not in high risk, so I don’t need the pill”
Barriers

• Pill burden: “I barely take my birth control every day, so I don’t know if I could take a pill every day”

• Reaction of peers to taking HIV medication: “It’s going put a irrelevant stigma on you that’s not even going be there”

• MSM only, fear of risk compensation: “My concern is, it might make me kind of lax about my safe sex practices”
PrEP and Sexual Risk Taking

- Mixed responses:
  - For the majority, PrEP would not change condom use
  - For some, PrEP would result in risk compensation, such as having sex without condoms or increasing their number of sexual partners
Health Care Access

- Most had no insurance coverage or had some form of public insurance
- Most utilized health departments, hospital clinics, or community health centers and the ED
- Perception that ED provided high quality care at lower cost
A Qualitative Study of Provider Thoughts on Implementing Pre-Exposure Prophylaxis (PrEP) in Clinical Settings to Prevent HIV Infection

Emily A. Arnold¹*, Patrick Hazelton¹, Tim Lane¹, Katerina A. Christopoulos², Gabriel R. Galindo¹, Wayne T. Steward¹, Stephen F. Morin¹

¹ Center for AIDS Prevention Studies, University of California San Francisco, San Francisco, California, United States of America, ² HIV/AIDS Division, San Francisco General Hospital, University of California San Francisco, San Francisco, California, United States of America
Introduction

• Little is known about provider views on PrEP implementation in clinical practice, including:
  – comfort prescribing PrEP
  – building clinical protocols
  – office capacity to support and monitor adherence

• **Specific aims:** To better understand how medical and service providers would:
  – potentially implement PrEP in their clinical settings
  – establish the practice and clinic policies needed to package PrEP as a form of HIV prevention
Methods

• In-depth interviews with 22 healthcare provider interviews in 3 cities in California from May-December 2011
• HIV specialists, PCPs seeing high numbers of MSM or TG women in their practices, providers in community based and STI clinics, and public health officials recruited employing snowball sampling
• Data analysis: inductive analysis, cross-case analysis, and analytical coding of textual data
Results: Themes

1. There is little consensus of the target population for PrEP
   Serodiscordant couples (ideal); public clinics- high risk individuals at no cost, with protocol guidance; private clinics- any insured individual who wants it.
   “This is going to be such a limited resource, that we want to make sure that it’s not necessarily going to all the worried well...”

2. Current models of care are not always well suited for prescribing PrEP
   Most providers felt that PrEP should be offered in primary care settings however current models of care need to change to accommodate the needs of patients on PrEP, particularly with respect to adherence counseling.
   “We are not used to having people that come back for check-ins on a regular basis.”
3. **Providers need more capacity before they can prescribe PrEP**

Training, referrals, and establishing reimbursement levels for care and drugs. Challenging for public health clinics.

“If we wanted our medical assistants or anyone to provide PREP, they would require some counseling training.”

4. **Monitoring patients on PrEP will be challenging**

Concerns about monitoring adherence, side effects and toxicities, resistance, and risk compensation among PrEP patients.

“I think a lot of young people tend to have less stable schedules.”
Results

5. PrEP has public health benefit

PrEP one part of a comprehensive strategy to control the HIV epidemic

“And so only treating the positive partner isn’t going to eliminate all the infections, and so finding the right balance between treatment and PrEP I think is important to have as a target.”
Conclusion and Future Direction

• There is general acceptance of PrEP as a preventive measure but concerns of effectiveness, change in risk behavior, ease of access need to be addressed

• More education at the patient, community and provider level is required

• There is a need for established protocols for medication dosing, adherence and side effects monitoring

• Cost remains a rate-limiting factor for PrEP access to the most high-risk individuals
Case, continues

• You learn that MH frequently engages in non-condom use with both men and women. You perform an HIV test, which is negative, and then provide him with counseling and a 1-month supply of FTC/TDF with 2 refills.

• He returns 1 month later with flu-like symptoms. On further discussion, he reports that he often forgets to take his FTC/TDF but has had continued risk behaviors.

• You perform a rapid HIV test which is positive, as is the confirmatory test.
Case, continues

• What are the current HIV testing trends in the United States?

• How likely is he to be linked to care?
HIV TESTING & LINKAGE TO CARE
2006 CDC Recommendations: Routine Testing for HIV

- ROUTINE voluntary screening for patients age 13-64 in health care settings
- NO separate written consent
- Pre-test counseling NOT required
- Re-screen high risk patients annually
- Linking positive patients to care and prevention is essential
HIV Testing Trends in the US, 2000-11

• Did the percentage of adults ever tested change?
  o Mixed results (NHIS vs NHANES)

• Did the percentage of adults tested in the past 12 months change?
  o No significant change (10.5% vs 10.1%)

• Did the percentage of adolescents tested change?
  o No significant change (11.6% vs 13.2%)

• Did the percentage of pregnant women tested in the past 12 months change?
  o No significant change (59.3% vs 53.7%)

Percentage of Adults who had Ever Been Tested for HIV in the United States, 2000-2010

Routine HIV Testing among Providers of HIV Care in the United States, 2009

A. D. McNaghten\textsuperscript{1*}, Eduardo E. Valverde\textsuperscript{1}, Janet M. Blair\textsuperscript{1}, Christopher H. Johnson\textsuperscript{1}, Mark S. Freedman\textsuperscript{1}, Patrick S. Sullivan\textsuperscript{2}

\textsuperscript{1} Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America, \textsuperscript{2} Rollins School of Public Health, Emory University, Atlanta, Georgia, United States of America
Methods

- Cross Sectional Survey

- **Sample:** MDs, NP, and PAs, practicing at sites within the CDC’s Medical Monitoring Project from June-September 2009.
  - Providers from facilities known to provide HIV care
  - Trainees excluded

- **Primary Outcome:** Self-reported adherence to CDC HIV screening recommendations

- **Funding Support:** CDC

# Results: HIV Provider Characteristics

2550 total MMP providers

735 respondents (42%)

506 care for HIV- patients (69%)


<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Profession</strong></td>
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<td></td>
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<tr>
<td>Physician ID</td>
<td>225</td>
<td>44</td>
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<tr>
<td>Physician non-ID</td>
<td>176</td>
<td>35</td>
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<tr>
<td>Nurse Practitioner</td>
<td>68</td>
<td>14</td>
</tr>
<tr>
<td>Physician Assistant</td>
<td>37</td>
<td>7</td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>Male</td>
<td>290</td>
<td>58</td>
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<tr>
<td>Female</td>
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<tr>
<td>Black</td>
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<td>9</td>
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<tr>
<td>Hispanic</td>
<td>49</td>
<td>10</td>
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<tr>
<td>White</td>
<td>359</td>
<td>71</td>
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<tr>
<td>Other</td>
<td>51</td>
<td>10</td>
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<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;39</td>
<td>78</td>
<td>15</td>
</tr>
<tr>
<td>39-49</td>
<td>189</td>
<td>38</td>
</tr>
<tr>
<td>&gt;50</td>
<td>234</td>
<td>47</td>
</tr>
<tr>
<td><strong># of HIV patients</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>116</td>
<td>24</td>
</tr>
<tr>
<td>20-74</td>
<td>206</td>
<td>41</td>
</tr>
<tr>
<td>&gt;75</td>
<td>172</td>
<td>35</td>
</tr>
</tbody>
</table>
Results: HIV Provider Testing Behaviors

- 60% report offering routine screening to all patients
- 31% report offering HIV screening mainly to those engaging in high risk behaviors
- 9% report not offering HIV screening

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>AOR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profession</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Nurse Practitioner</td>
<td>5.6 (2.6-11.9)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Physician Assistant</td>
<td>1.7 (0.8-3.9)</td>
<td>0.23</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
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<tr>
<td>Black</td>
<td>2.6 (1.2-6.0)</td>
<td>0.02</td>
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<tr>
<td>Hispanic</td>
<td>2.0 (0.9-4.2)</td>
<td>0.09</td>
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<td>White</td>
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<td>0.94</td>
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<tr>
<td>Other</td>
<td>1.0 (0.5-2.0)</td>
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<tr>
<td>Age</td>
<td></td>
<td></td>
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<tr>
<td>&lt;39</td>
<td>1.9 (1.0-3.5)</td>
<td>0.03</td>
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<td>39-49</td>
<td>2.1 (1.4-3.3)</td>
<td>&lt;0.001</td>
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<td>&gt;50</td>
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<tr>
<td># of HIV patients/month</td>
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<tr>
<td>&lt;20</td>
<td>0.2 (0.1-0.3)</td>
<td>&lt;0.001</td>
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<tr>
<td>20-74</td>
<td>0.4 (0.2-0.6)</td>
<td>&lt;0.001</td>
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<tr>
<td>&gt;75</td>
<td>Reference</td>
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</table>

Conclusions and Future Directions

- Despite increased awareness of benefits of early detection of HIV infection, many HIV providers still report risk based testing.
- NPs, younger providers, black providers, and providers with high HIV-infected patient loads were more likely to offer routine HIV testing.
- Testing will need to increase at a faster rate to meet the National HIV/AIDS Strategy goal of 90% of persons with HIV aware of their status by 2015.
Linkage to Care: Background

- National HIV/AIDS Strategy Goals
  - 90% of persons with HIV aware of status by 2015
  - “Seamless system to immediately link people to continuous and coordinated quality care when they learn they are infected with HIV.”
Linkage to Care: Background

• CDC estimates only 69% of those who know they have HIV are linked into care

• Surveillance Data from multiple health departments
  – 48-67% linked to care within 3 months of HIV diagnosis

• Retrospective data from MMP
  – 23% report delay in entry into care of >3 months

• Prospective data from Never in Care Study
  – 50% tested positive in non-medical environment
  – Denial and lack of perceived need for medical care

Patterns and Correlates of Linkage to Appropriate HIV Care After HIV Diagnosis in the US Medicaid Population

Stephen S. Johnston, MA,* Timothy Juday, PhD,† Daniel Seekins, MD,† Tony Hebden, PhD,† Nicole Fulcher, MA,* Amanda M. Farr, MPH,* Bong-Chul Chu, PhD,* and C. Daniel Mullins, PhD‡
Methods

• Retrospective analysis of Medicaid claims data from 15 states

• Sample: patients age 18-64 with an HIV test from 2003-2010 followed by an HIV diagnosis

• Primary Outcome: linkage to care
  – Defined as receipt of CD4 and VL testing

• Funding Support: Bristol-Myers Squibb
## Results: Patient Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number</th>
<th>Percent</th>
</tr>
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<tbody>
<tr>
<td><strong>Age</strong></td>
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<tr>
<td>18-34</td>
<td>3621</td>
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<td>35-44</td>
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<td>55-64</td>
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<td>White</td>
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<tr>
<td>Other</td>
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## Results: Patient Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Diagnosed inpatient</td>
<td>1409</td>
<td>21</td>
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<tr>
<td>Clinical Indicator for HIV</td>
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<tr>
<td>Unexplained Fever</td>
<td>246</td>
<td>3.6</td>
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<tr>
<td>Unexplained Weight Loss</td>
<td>107</td>
<td>1.6</td>
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<tr>
<td>Lymphadenopathy</td>
<td>100</td>
<td>1.5</td>
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<td>Other</td>
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<td>1.7</td>
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<tr>
<td>Co-infection</td>
<td></td>
<td></td>
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<tr>
<td>Hepatitis B</td>
<td>41</td>
<td>0.6</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>240</td>
<td>3.5</td>
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</table>

Results: Time to Linkage to Care

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<thead>
<tr>
<th>Time to Linkage to Care</th>
<th>HR (95% CI)</th>
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</thead>
<tbody>
<tr>
<td>Male vs Female</td>
<td>1.70 (1.21-2.38)</td>
</tr>
<tr>
<td>Black vs White</td>
<td>2.03 (1.75-2.36)</td>
</tr>
<tr>
<td>Hispanic vs White</td>
<td>0.80 (0.59-1.09)</td>
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<tr>
<td>Diagnosed Inpatient</td>
<td>1.36 (1.20-1.59)</td>
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<tr>
<td>Any Clinical Indicator</td>
<td>2.19 (1.88-2.55)</td>
</tr>
<tr>
<td>Hepatitis Coinfection</td>
<td>0.55 (0.38-0.78)</td>
</tr>
</tbody>
</table>

Conclusions and Future Directions

• The proportion of patients who linked to appropriate HIV care was very low
• Asymptomatic patients had lower rates of linkage to care
• In this study, Blacks had higher rates of linkage to care than Whites
• Limitations: Medicaid claims data
• Strengths: Large numbers of patients, no selection bias
Entry into Care Guidelines:
International Association of Physicians in AIDS Care

Recommends:

• Systematic monitoring of successful entry into care (II A)
• Systematic monitoring of retention in care (II A)
• Brief strengths-based case management for all newly diagnosed (II B)
• Intensive outreach for those not engaged in care within 6 months of diagnosis may be considered (III C)
• Use of peer or paraprofessional navigators may be considered (III C)

Case, continues

- You and MH decide that he will receive his HIV care with you. After several missed appointments, he presents to care 7 months after his initial diagnosis. His CD4 count is 410 cells/µL, HIV viral load 8,000 copies. His other testing, including hepatitis screening is negative.

  - Are there any benefits of initiating ART now?
  - What are the benefits of a short-course of ART?
  - What can you tell him about his risk of morbidity and mortality?
NEWLY DIAGNOSED HIV
Enhanced CD4+ T-Cell Recovery with Earlier HIV-1 Antiretroviral Therapy

Tuan Le, M.D., Dr.P.H., Edwina J. Wright, M.D., Davey M. Smith, M.D., Weijing He, M.D., Gabriel Catano, M.D., Jason F. Okulicz, M.D., Jason A. Young, Ph.D., Robert A. Clark, M.D., Douglas D. Richman, M.D., Susan J. Little, M.D., and Sunil K. Ahuja, M.D.
Background

• Triphasic trajectory of CD₄ cell counts:
  – Rapid loss
  – Transient recovery
  – Progressive decline

• Unknown whether early ART augments CD₄ recovery

• **Aim:** To determine whether ART initiation earlier vs. later enhanced the likelihood and rate of restoration of CD₄ counts to normal among patients starting ART before and after CD₄ cell count = 500 cells/µL
Methods

• **Design**: prospective, observational cohort

• **Participants**: acute or early HIV-1 infection from the San Diego Primary Infection Cohort, 1996 to 2010 who had not (study 1) and had initiated ART (study 2)

• **Primary Outcome**:
  – CD₄ T-cell peak
  – Primary CD₄ cell recovery (attainment of ≥ 900 cells/µL over 48 months of follow-up)
### Study 1: Patient Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n=384</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Sex - %</td>
<td>97</td>
</tr>
<tr>
<td>European American - %</td>
<td>78</td>
</tr>
<tr>
<td>Age at EDI, median (IQR)</td>
<td>33 (27-40)</td>
</tr>
<tr>
<td>Time from EDI to study entry – weeks, median (IQR)</td>
<td>10 (8 – 13)</td>
</tr>
<tr>
<td>Duration of Follow-Up without Treatment – months, median (IQR)</td>
<td>8 (4-13)</td>
</tr>
<tr>
<td>Viral Load at Study Entry - log10 copies/mL, median (IQR)</td>
<td>4.9 (4.1-5.6)</td>
</tr>
<tr>
<td>CD4 count at Study Entry - cells/mm³, median (IQR)</td>
<td>495 (383-622)</td>
</tr>
<tr>
<td>Time from EDI to peak CD4 count – months, median (IQR)</td>
<td>3.5 (3.6-5.2)</td>
</tr>
<tr>
<td>CD4 count at peak - cells/mm³, median (IQR)</td>
<td>763 (573-987)</td>
</tr>
<tr>
<td>Difference between CD4 count at peak and at study entry – cells/mm³, median (IQR)*</td>
<td>234 (95 – 437)</td>
</tr>
</tbody>
</table>

EDI = estimated date of infection; *p<0.001
## Study 2: Patient Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>ART ≤ 4 mos after EDI n=97</th>
<th>ART &gt; 4 mos after EDI n=116</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Sex - %</td>
<td>96</td>
<td>94</td>
</tr>
<tr>
<td>European American* - %</td>
<td>90</td>
<td>73</td>
</tr>
<tr>
<td>Age at EDI, median (IQR)</td>
<td>36 (30-42)</td>
<td>34 (27-41)</td>
</tr>
<tr>
<td>Age at initiation of ART, median (IQR)</td>
<td>36 (31-42)</td>
<td>35 (28-42)</td>
</tr>
<tr>
<td>Time from EDI to study entry – weeks, median (IQR)*</td>
<td>10 (2-10)</td>
<td>13 (10-19)</td>
</tr>
<tr>
<td>CD₄ count at ART initiation - cells/mm³, median (IQR)*</td>
<td>504 (378-720)</td>
<td>386 (281-554)</td>
</tr>
<tr>
<td>VL at ART initiation – log₁₀ copies/mL, median (IQR)*</td>
<td>5.2 (4.6-5.8)</td>
<td>4.8 (4.5-5.2)</td>
</tr>
<tr>
<td>Time from EDI to ART initiation – mos, median (IQR)*</td>
<td>3 (1-3)</td>
<td>10 (6-17)</td>
</tr>
<tr>
<td>Time from ART initiation to VL suppression, median (IQR)*</td>
<td>4 (2-6)</td>
<td>4 (2-5)</td>
</tr>
<tr>
<td>Time ART initiation to first CD₄ count ≥ 900 – mos, median (IQR)*</td>
<td>4 (2-13)</td>
<td>15 (6-22)</td>
</tr>
<tr>
<td>Attainment of CD₄ count ≥ 900 cells/mm³ within 48 mos after ART initiation -%*</td>
<td>64</td>
<td>34</td>
</tr>
</tbody>
</table>

EDI = estimated date of infection; *p<0.05
## Participant Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Standard Care (n=123)</th>
<th>12-Week ART (n=120)</th>
<th>48 Week ART (n=123)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Sex - %</td>
<td>60</td>
<td>59</td>
<td>60</td>
</tr>
<tr>
<td>Age – median (IQR)</td>
<td>31 (25-39)</td>
<td>32 (24-39)</td>
<td>33 (26-41)</td>
</tr>
<tr>
<td>Estimated time since seroconversion at randomization – wk, median (IQR)</td>
<td>11 (8-15)</td>
<td>12 (9-15)</td>
<td>12 (9-15)</td>
</tr>
<tr>
<td>CD4 cell count – cells/mm³, median (IQR)</td>
<td>543 (404-715)</td>
<td>519 (433-638)</td>
<td>605 (463-750)</td>
</tr>
<tr>
<td>HIV RNA level – copies/mL, median (IQR)</td>
<td>4.7 (3.7-5.2)</td>
<td>4.4 (3.6-5.2)</td>
<td>4.4 (3.8-5.1)</td>
</tr>
<tr>
<td>Any drug resistance at Stanford Level 4 or 5 - %</td>
<td>7</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Reported HIV seroconversion – type illness - %</td>
<td>66</td>
<td>53</td>
<td>57</td>
</tr>
</tbody>
</table>
Trajectories of CD4+ T-Cell Counts before and after Initiation of ART.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Odds Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1:</strong></td>
<td>CD4 count - &lt; 500 vs. ≥ 500 cells/mm³ at ART initiation</td>
<td>0.07 (0.04-0.15)</td>
</tr>
<tr>
<td><strong>Model 2:</strong></td>
<td>Time from EDI to ART initiation – each increase of 1 mos</td>
<td>0.90 (0.85-0.96)</td>
</tr>
<tr>
<td><strong>Model 3:</strong></td>
<td>Time from EDI to ART initiation - &gt;4 mos vs. ≤ 4 mos</td>
<td>0.35 (0.17-0.71)</td>
</tr>
<tr>
<td><strong>Model 4:</strong></td>
<td>Initiation of ART ≤ 4 mos, 4-12 mos, or &gt; 12 mos after EDI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;4-12 mos vs. ≤ 4 mos</td>
<td>0.48 (0.21-1.06)</td>
</tr>
<tr>
<td></td>
<td>&gt;12 vs. ≤ 4 mos</td>
<td>0.21 (0.08-0.55)</td>
</tr>
<tr>
<td><strong>Model 5:</strong></td>
<td>Initiation of ART ≤ 4 mos, 4-12 mos, or &gt; 12 mos after EDI with CD4+ at ART initiation ≥ 500 cells/mm³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;4-12 mos vs. ≤ 4 mos</td>
<td>0.74 (0.18-2.94)</td>
</tr>
<tr>
<td></td>
<td>&gt;12 vs. ≤ 4 mos</td>
<td>0.17 (0.04-0.71)</td>
</tr>
<tr>
<td><strong>Model 6:</strong></td>
<td>Initiation of ART ≤ 4 mos, 4-12 mos, or &gt; 12 mos after EDI with CD4+ at ART initiation &lt; 500 cells/mm³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;4-12 mos vs. ≤ 4 mos</td>
<td>0.26 (0.13-1.02)</td>
</tr>
<tr>
<td></td>
<td>&gt;12 vs. ≤ 4 mos</td>
<td>0.27 (0.08-0.94)</td>
</tr>
</tbody>
</table>

*All adjusted for race, length of time on ART; models 2, 3, 4 also adjusted for CD4 count at ART initiation, model 1 also adjusted for whether ART was initiated earlier*
Conclusions and Future Directions

• After acute infection, months 4 and 12 represent key inflection points in CD4 trajectory with spontaneous rise and then decline.
• Likelihood of CD4 count recovery was greatest among those with higher baseline CD4 count and treatment initiation within 4 months of infection.
• **Limitations**: clinical progression not assessed; participants may not be generalizable given decision to initiate ART, male predominance.
• Future studies confirming these findings and impact on viral reservoirs are needed.
Short-Course Antiretroviral Therapy in Primary HIV Infection

The SPARTAC Trial Investigators*
Background

• No data from RCTs to demonstrate whether initiating ART during primary HIV infection delays disease progression

• **Aims:** Short Pulse Anti-retroviral Therapy at Seroconversion sought to determine whether short-term ART during primary HIV infection can lengthen the time until CD$_4$ < 350 cells/µL or require long-term ART
Methods

• **Design**: open-label, RCT with ART for 48 weeks, ART for 12 weeks, or no therapy
  – Recommended treatment: PI-based regimen

• **Participants**: Primary HIV infection across 8 countries; excluded if ART was indicated

• **Primary Outcome**: CD4 count < 350 cells/µL or long-term ART

• **Funding and Support**: Wellcome Trust, Imperial College, London; Abbott Laboratories
Time from Randomization to End Points According to Study Group.

Conclusions and Future Directions

• 48 week course of ART delayed disease progression but benefit was not significantly longer than duration of the treatment.

• No benefit with 12 week course of ART compared to no treatment.

• Future studies to evaluate impact of longer term ART during primary HIV infection and earlier treatment initiation are warranted.
Predictive Accuracy of the Veterans Aging Cohort Study Index for Mortality With HIV Infection: A North American Cross Cohort Analysis

Amy C. Justice, MD, PhD,* Sharada P. Modur, PhD,† Janet P. Tate, ScD, MPH,‡
Keri N. Althoff, PhD, MPH,† Lisa P. Jacobson, ScD, MS,‡ Kelly A. Gebo, MD, MPH,§
Mari M. Kitahata, MD, MPH,|| Michael A. Horberg, MD,¶ John T. Brooks, MD,# Kate Buchacz, PhD,#
Sean B. Rourke, PhD,** Anita Rachlis, MD,†† Sonia Napravnik, PhD,†† Joseph Eron, MD,††
James H. Willig, MD, §§ Richard Moore, PhD,||| Gregory D. Kirk, MD, PhD, MPH,¶¶
Ronald Bosch, PhD,## Benigno Rodriguez, MD,*** Robert S. Hogg, PhD,†††
Jennifer Thorne, MD, PhD,††† James J. Goedert, MD, §§§ Marina Klein, MD, MSc,||||
John Gill, MD, §§§ Steven Deeks, MD,#### Timothy R. Sterling, MD,**** Kathryn Anastos, MD,††††
and Stephen J. Gange, PhD,† for the NA-ACCORD and VACS Project Teams

J Acquir Immune Defic Syndr • Volume 62, Number 2, February 1, 2013
VACS Index

• Comprehensive measure including:
  – CD4 count, HIV-1 RNA viral load, hemoglobin, platelets, AST, ALT, creatinine, HCV status, and age
  – Initially developed in Veterans Aging Cohort Study

• Validated in NA-ACCORD data: more reliably predicts mortality risk among patients on at least one year of antiretroviral therapy than the restricted index (HIV biomarkers and age alone) (C statistics: 0.77 vs. 0.74)

• Potential use for research and clinical purposes
Transmitted Antiretroviral Drug Resistance in New York State, 2006-2008: Results from a New Surveillance System

Adam C. Readhead\textsuperscript{1*}, Daniel E. Gordon\textsuperscript{2*}, Zhengyan Wang\textsuperscript{2}, Bridget J. Anderson\textsuperscript{2}, Kathleen S. Brousseau\textsuperscript{2}, Maria A. Kouznetsova\textsuperscript{2}, Lisa A. Forgione\textsuperscript{1}, Lou C. Smith\textsuperscript{2}, Lucia V. Torian\textsuperscript{1*}

\textsuperscript{1} The New York City Department of Health and Mental Hygiene, HIV Epidemiology and Field Services Program, New York, New York, United States of America. \textsuperscript{2} The New York State Department of Health, Bureau of HIV/AIDS Epidemiology, Albany, New York, United States of America.

August 2012 | Volume 7 | Issue 8 | e40533
Genotypes and Drug Resistance

- **Design:** Cross-sectional study of 13,109 new HIV cases in NY state, 2006-2008 using health department surveillance data
- **Outcomes:** proportion with genotype; resistance patterns
- **Key Findings:**
  - 43% had genotype within 3 months of diagnosis;
  - 11% with any evidence of transmitted drug resistance;
  - proportion with any NNRTI, NRTI and PI class resistance: 6%, 4%, 3% respectively
- **Conclusions:** TDR was stable over time, but suboptimal resistance testing among patients newly diagnosed
Case, continues

- Since the CD4 count was 410 cells/µL and then 380 cells/µL on repeat, you decide to order a genotype and plan for long-term ART.
  - Meanwhile, as you think about his care, you wonder about differences in HIV care by age and race/ethnicity.

Laurie Linley, MPH, Joseph Prejean, PhD, Qian An, MS, Mi Chen, MS, and H. Irene Hall, PhD

August 2012, Vol 102, No. 8 | American Journal of Public Health
Background

• The proportion of new HIV diagnoses among older US adults is increasing
  – In 2001, 13% diagnoses were among ≥ 50 years
  – In 2008, 16% were among ≥ 50 years
• HIV infected adults are living longer and the US population is aging
• Sexual risk behaviors persist and older adults may not be as aware of the risk of HIV
• This study sought to characterize the epidemic among older adults and examine differences between diagnoses in older and younger patients

Source: CDC, Stall and Catania 1994
Methods

- Analyzed data reported by states to CDC on HIV diagnoses between 2005-2008 in age ≥ 13
- Age based on first documented diagnosis
- If no transmission risk category reported, assigned by multiple imputation
- Average annual rates of HIV diagnoses per 100,000 persons were calculated using US Census Bureau estimates of population
- A diagnosis was defined as ‘late’ if AIDS diagnosis within 12 months of HIV diagnosis
Results

• Among <50 years, rates among:
  – Blacks were 7.7 times that of Whites
  – Hispanics/Latinos 2.9 times that of Whites

• Among ≥ 50 years, rates among:
  – Blacks were 12.6 times that of Whites
  – Hispanics/Latinos 5.0 times that of Whites

• Among ≥ 65 years, rates among:
  – Blacks 16.9 times that of Whites
  – Hispanics/Latinos 7.7 times that of Whites
Additional findings

- 18% of cases among men ≥ 50 years compared with 8% younger men were attributed to IDU (P < .001)
- 25% cases among men ≥ 50 years attributed to heterosexual contact compared with 13% younger men (P < .001)
- 53% among men ≥ 50 years were attributed to MSM compared with 74% younger men (P < .001)
- 47% of older persons had late diagnosis, compared with 32% of younger (P < .001)
Discussion/Implications

• Racial and ethnic disparities in HIV diagnoses persist and are even more pronounced among older US adults

• Differences in transmission categories exist by age

• Diagnoses among older persons made later in the course of infection. These are missed opportunities for prevention as well as treatment

• HIV prevention and testing strategies should be tailored to older subpopulations

• Addressing risk behaviors and testing in older populations is important for clinicians treating these age groups
Primary Care Provider Cultural Competence and Racial Disparities in HIV Care and Outcomes

Somnath Saha, MD, MPH\textsuperscript{1,2}, P. Todd Korthuis, MD, MPH\textsuperscript{2}, Jonathan A. Cohn, MD\textsuperscript{3}, Victoria L. Sharp, MD\textsuperscript{4}, Richard D. Moore, MD, MHS\textsuperscript{5}, and Mary Catherine Beach, MD, MPH\textsuperscript{5}

\textsuperscript{1}Section of General Internal Medicine, Portland VA Medical Center, Portland, OR, USA; \textsuperscript{2}Division of General Internal Medicine & Geriatrics, Oregon Health & Science University, Portland, OR, USA; \textsuperscript{3}Division of Infectious Diseases, Department of Medicine, Wayne State University School of Medicine, Detroit, MI, USA; \textsuperscript{4}Center for Comprehensive Care, St. Luke’s-Roosevelt Hospital Center, New York, NY, USA; \textsuperscript{5}Division of General Internal Medicine, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, USA.

JGIM. 2013. Jan 10. [Epub ahead of print]
Background

• In addition to disparities in HIV incidence and diagnoses, racial and ethnic minorities experience disparities in HIV treatment and outcomes
  – Less likely to receive ARVs
  – Less likely to be adherent
  – Decreased viral suppression
  – Poorer disease progression outcomes
  – Increased mortality

• Patient-provider relationships have been demonstrated to impact ARV utilization, adherence, and virologic suppression

• This study sought to evaluate cultural competence (CC) among HIV providers and associations with: receipt of ARV therapy, self-efficacy in managing medications, adherence, and viral suppression
Methods

• Four outpatient HIV sites (Baltimore, Detroit, New York, Portland, OR)
• Patients: HIV-infected, ≥ 19 years, English, had at least one prior visit with provider
• Goal to enroll 10 patients per provider
• Data collection: baseline questionnaires; post-encounter surveys; patient interviews; medical record abstraction
• Measured self-efficacy using an existing 6-item instrument (Shivley et al 2002) for HIV disease management self-efficacy
Methods: Provider Cultural Competence

- No existing instruments with face value for use with PCPs
- A novel instrument was developed after systematic review of 29 conceptual models
- Core dimensions: provider awareness; attitudes; skills; behaviors
- Pool of survey items reflecting these dimensions were developed and then pilot tested
- Providers rank agreement on each item on a 6-point Likert scale
Results

• Nonwhite patients seeing moderate [OR 2.56 (1.26–5.19)] to high [OR 2.52 (1.13–5.60)] CC providers were more likely to be on ARV therapy than those with low CC providers.

• High CC independently associated with nonwhite patients’ self-efficacy [OR 2.12 (1.05–4.29)].

• Moderate CC significantly associated with medication adherence [OR 3.33 (1.43–7.77)].

• There was no significant difference in ARV receipt by race; however, nonwhites had significantly
  – lower adherence [OR 2.63 (1.11–6.25)]
  – less adequate virologic suppression [OR 2.24 (1.26–3.97)].
### Adjusted association of patient race with outcomes, stratified by provider cultural competence

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Provider CC Tertile</th>
<th>White vs Nonwhite (n=437)</th>
<th>White vs African American (n=351)</th>
</tr>
</thead>
<tbody>
<tr>
<td>On ARV</td>
<td>Low</td>
<td>6.21 (1.50-25.7)</td>
<td>7.76 (1.56-38.6)</td>
</tr>
<tr>
<td></td>
<td>Middle/High</td>
<td>0.71 (0.32-1.61)</td>
<td>0.61 (0.24-1.52)</td>
</tr>
<tr>
<td>Medication Self-efficacy</td>
<td>Low</td>
<td>3.77 (1.24-11.4)</td>
<td>4.13 (1.19-14.3)</td>
</tr>
<tr>
<td></td>
<td>Middle/High</td>
<td>1.14 (0.59-2.22)</td>
<td>1.10 (0.53-2.30)</td>
</tr>
<tr>
<td>Adherence</td>
<td>Low</td>
<td>6.07 (1.09-33.9)</td>
<td>4.56 (0.69-30.0)</td>
</tr>
<tr>
<td></td>
<td>Middle/High</td>
<td>1.63 (0.57-4.69)</td>
<td>1.74 (0.58-5.25)</td>
</tr>
<tr>
<td>Viral Suppression</td>
<td>Low</td>
<td>13.0 (3.43-49.0)</td>
<td>21.8 (4.01-118.4)</td>
</tr>
<tr>
<td></td>
<td>Middle/High</td>
<td>1.20 (0.60-2.42)</td>
<td>1.27 (0.60-2.66)</td>
</tr>
</tbody>
</table>
Limitations

• Limited to English-speaking patients

• Cultural competence instrument is novel and has not been extensively validated
Discussion/Implications

• Cultural competence (CC) has been extensively promoted, but historically there has been limited evidence to support improved outcomes

• Further validation of CC measures and instruments needed

• Efforts to improved CC may have the potential to reduce health care disparities
Additional studies of interest

David B. Hanna\textsuperscript{a}, Richard M. Selik\textsuperscript{b}, Tian Tang\textsuperscript{b} and Stephen J. Gange\textsuperscript{a}

\textit{AIDS} 2012, \textbf{26}:95–103
Summary/Implications

• Aim to evaluate HIV incidence and risk behaviors among women in 10 high prevalence urban/periurban areas in the US

• Eligibility: self-identified women age 18-44, reporting at least one unprotected sex with a man within prior 6 months, HIV negative (by self report), exhibiting certain specific risk history/behaviors, and residing in specified areas

• Venue-based recruitment. Enrolled 05/2009-07/2010

• Primary outcome: HIV incidence (composite measure)

• 1.5% were diagnosed with HIV at enrollment. Annual prevalence was 0.32%-- substantially higher than CDC estimates for 2009
Improvement in the Health of HIV-Infected Persons in Care: Reducing Disparities

Richard D. Moore, Jeanne C. Keruly, and John G. Bartlett
Summary/Implications

- Single site longitudinal HIV clinical cohort (Baltimore), 1995-2010
- Compared: race (black/white), gender, HIV risk group (MSM, IDU, heterosexual)
- Outcomes: ARV receipt, HIV RNA, CD4 count, OI, mortality
- By 2010:
  - 87% on ARVs
  - Median HIV RNA <200
  - Median CD4 count 475 cells/mm³
  - OI 2.4 per 100 PY
  - Mortality 2.1 per 100 PY
- No significant differences by any groups in ARV receipt, OI, mortality
- IDU had significantly lower median CD4 count (by 79 cells/mm³) and men significantly lower (by 55 cells/mm³) than women
- Blacks had 0.24 log higher HIV RNA than whites and IDU had 0.28 log higher HIV RNA
- Disparities can be addressed with comprehensive services and state-of-the-art guideline-based HIV care. Some challenges still exist
Additional References

Pre-Exposure Prophylaxis


Additional References

Testing, Linkage and Retention in Care


Managing Newly Diagnosed HIV

Questions

• Please complete your evaluations