Overview of Prevention for People Living with HIV:
Past, Present, and Possible Future Directions

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A Global Prevention “Cocktail”

- Until about 2000, HIV prevention approaches focused almost exclusively on seronegatives, and relatively little attention was devoted to “prevention for positives” (CDC, 2003; W. Fisher et al., 2009; Global HIV Prevention Working Group, 2004; Janssen et al., 2001; NIH, 1997; WHO, 2004)

- For an effective global HIV prevention portfolio, we need the implementation of “prevention cocktails” that involve potent HIV prevention interventions for seronegatives, and potent HIV prevention interventions for seropositives
  - In many cases these “cocktails” may need to involve both behavioral and biological approaches to reduce risk of transmission for both seronegatives and seropositives
Why Prevention with Positives?

- All new HIV infections must involve an HIV seropositive individual.

- Given limited funds, it may be cost-effective to encourage HIV testing and to intervene with individuals who are HIV positive, as well as those who are HIV negative.

- While most HIV positive individuals who know their serostatus reduce their risk levels, some do not.

- In the ART era, prevalence rates for HIV infection will continue to climb. Prevention for positives would seem to make sense.
Estimated HIV Infection Incidence and Prevalence, by Year, 1977-2003, United States


Table developed based on estimates from

WHO/UNAIDS/UN The Millennium Goals Report, 2009
Adults and Children Estimated to be Living with HIV, 2008

Total: 33.4 (31.1 – 35.8) million

Source: UNAIDS/Global Report, December 2009
Some interventions for seropositives that may reduce new HIV infections

- Increased HIV Testing
  - Identifying Seropositives
  - Effects of Testing On Risk Behavior

- HIV Care
  - Effects of Care Initiation & Maintenance on Behavioral and Biologic Risk

- Initiating ARVs
  - Effects on Behavioral & Biologic Risk

- ARV Adherence
  - Effects of Adherence on:
    - HIV Risk Behavior
    - Biologic risk

- Traditional Prevention for Positives
  - Effects on Risk Behavior

- Next Generation HIV Prevention for Positives Interventions
Increased HIV testing: *Identifying Seropositives*

- **Proportion of PLWH who know their status varies:**
  - About 75% of all PLWH in the US are aware of their status (Marks, Crepaz & Janssen; 2006)
  - The 25% of PLWH who do not know their status may account for over 50% of all new infections annually (Marks, Crepaz & Janssen; 2006)
  - Globally, the proportion of PLWH aware of their HIV status varies (5% - 60%), and a large proportion of PLWH remain unaware of their HIV status (WHO/UNAIDS 2008 Progress Report)
  - It is likely that globally, PLWH who are unaware of their status account for the majority of new HIV infections annually
Increased HIV testing: Identifying Seropositives

- Availability and uptake of HIV testing
  - Results from low- to middle-income countries indicate the median percent of persons ever tested for HIV who have received their test results is quite low:
    - 10.9% of all women, 10.3% of all men surveyed
    - 3.9% of all women, 3.8% of all men in sub-Saharan Africa
    - In fact, in low and middle income countries, 43% of those who had ever received an HIV test, had done so in the past year.

(WHO/UNAIDS 2008 Progress Report)
Effects of *HIV Testing* on Risk Behavior

• *Meta analyses examining the effects of HIV testing on subsequent risk behavior find:*
  
  – Reduced risk behavior among VCT participants compared to non-testers in developing countries (Denison et al., 2008)
  
  – The largest reductions in sexual risk occur among seropositives and serodiscordant couples post diagnosis (Denison et al., 2008; Weinhardt et al., 1999)
  
  – Among PLWH who learn their HIV status, sexual risk behaviors with HIV- and status unknown partners are reduced by 68% (Marks et al., 2005)

• *Nevertheless, there are fluctuations in risk behavior over time.*
  
  – Studies continue to indicate that proximately 1/3 of PLWH continue to engage in risk behavior post diagnosis (e.g., Crepaz et al., 2002; Kalichman, 2000)
HIV Care

- HIV Testing
- Initiating ARVs
- ARV Adherence
- Prevention for Positives
- Next Generation HIV Prevention for Positives Interventions
Effects of *Initiation & Maintenance of Care* on Behavioral Risks

- Some recent evidence indicates that engagement in HIV care *may be associated with*:
  - Reductions in risk behavior among recently diagnosed PLWH who are successfully *linked to primary care* (Metsch et al., 2008) and those *retained in care over time* (Metsch et al., 2008; Takizawa et al., 2007)
  - *Nevertheless, risk behavior continues to be observed in clinical care samples* (e.g., Cornman et al., 2008; Ebelding et al., 2000; Fisher et al., 2006 Sarna et al., 2008; Vlahov et al., 2001).
Effects of *Initiation & Maintenance of Care* on Biological Risks

- **Being in care can provide access to ARVS, which can lower risk of transmission.** *(Discussed on slides to follow)*

- **Maintaining care can also support other biologic benefits.**
  - Maintenance of regular care facilitates monitoring of ARVs, viral load, CD4 count, and co-morbid conditions, reducing risk of transmission.

- **Regarding PfP, initiation and maintenance of care may have behavioral and biologic impacts on risk behavior and infectiousness** *(Temoshok & Wald, 2008)*
Initiating ARVs

HIV Testing

HIV Care

Initiating ARVs

Prevention for Positives

ARV Adherence

Next Generation HIV Prevention for Positives Interventions
Effects of *Initiating ARVs* on Biologic Risk

- Effects of ARVs on Biologic Risk
  - ARV’s ability to suppress viral load is associated with a reduction of transmission risk to sexual partners (Lalani & Hicks, 2007).
Results regarding the effects of ARVs on Behavioral Risk are more complex:

- Some factors are associated with no change in risk, others with decreased risk, and still others with increased risk.
  
  - Initiating ARV therapy, or having a suppressed viral load, is **NOT generally associated with increased risk behavior among PLWH** (e.g., Burman et al., 2008; Crepaz et al., 2004; Kaida et al., 2008; Kennedy et al., 2007; Sarna et al., 2008; Stephensen et al., 2003)

  - Some African studies found a **decrease** in risk behavior among PLWH after initiating ARVs (Kennedy et al., 2007; Kida et al., 2008; Lutchers; 2008).
Effects of *Initiating ARVs* on Behavioral Risk

- **Factors related to increased behavioral risk**
  - In both the US and Africa, attitudes about the reduced risk of transmission due to ARVs, or reduced or suppressed viral load (e.g., Crepaz et al., 2004; Cohen et al., 2009; Cox et al., 2008; Huebner & Gerend, 2001; Kaida et al., 2008; Kalichman et al., 2001; Lalani & Hicks, 2007; Ostrow et al., 2002; Vanable et al., 2000)
  - Perceived *low* viral load, regardless of *actual* viral load (Stolte et al., 2004)
  - Safer sex fatigue among HIV+ MSM (Cox et al., 2004; Ostrow et al., 2002)
  - Partner’s serostatus (Cox et al., 2004; Luchters et al., 2008)
  - Cohabitation with main partner, fertility desires, non-disclosure, and stigma in developing countries (Kaida et al., 2008; Luchters et al., 2008)
Summary of Effects of *Initiating ARVs* on Biologic and Behavioral Risk

- Though NOT eliminated, ARVs *can* reduce the overall *biologic* risk of transmission.

- The findings concerning *behavioral* risk are more complex.
ARV Adherence

HIV Testing -> HIV Care

Initiating ARVs

Prevention for Positives

ARV Adherence

Next Generation HIV Prevention for Positives Interventions
Effects of ARV Adherence on Behavioral Risk

- Exploration of the relationship between adherence to ARVs and behavioral risk suggests some overlap, although more research is needed
  - Findings suggest achieving optimal adherence may be related to a decrease in sexual risk behavior (e.g., Diamond et al., 2005; Flaks et al., 2003; Kalichman et al., 2008; Wilson et al., 2002)

- The dynamics of risk behavior in the context of varying levels of adherence needs further research, given its potential to transmit resistant virus (Remien et al., 2007)
Effects of ARV Adherence on Biologic Risk

- **PLWH who are enrolled in ARV adherence interventions adhere better, have lower viral loads and are less infectious** (Simoni et al., 2006)

- **Thus, interventions aimed at facilitating optimal levels of adherence are a critical component of the PfP portfolio**

- **Together, adherence promotion interventions and maintenance in care:**
  - Can work symbiotically to facilitate improved outcomes and reduced infectivity via:
    - Viral suppression and reduced risk of transmission
    - Regular clinic visits provide opportunity for ongoing treatment and for adherence and risk reduction counseling to occur (Temoshok & Wald, 2008)
Prevention for Positives

HIV Testing

Initiating ARVs

ARV Adherence

HIV Care

Prevention for Positives

Next Generation HIV Prevention for Positives Interventions
Effects of *Prevention for Positives Interventions* on HIV Risk Behavior

- Overall, the goal of PfP interventions is to prevent HIV transmission to others and ensure optimal health in PLWH
  - Most *behavioral PfP interventions* to date focus on safer behavior, which decreases HIV transmission and helps prevent seropositives from acquiring new pathogens.
Effects of *Prevention for Positives Interventions* on HIV Risk Behavior

- **Behavioral Prevention for Positives interventions (PfP)** can target a diverse range of preventive behaviors.
  - Traditional prevention behaviors
    - e.g., safer sex behaviors, safer needle use, disclosure
  - Harm reduction behaviors
    - e.g., condom use with non-primary partners, strategic sexual positioning, serosorting

- **Given the substantial numbers of PLWH worldwide, PfP can impact the epidemic through behavior change by PLWH who know their status and currently engage in risky behavior**
Effects of *Prevention for Positives Interventions* on HIV Risk Behavior

- Previous Meta-analyses have demonstrated the effectiveness of behaviorally-focused PfP interventions in promoting safer behavior among PLWH who know their status:
  - PfP interventions are more effective on average than typical “prevention for negatives” interventions in reducing risk behavior (Crepaz et al., 2006; Johnson et al., 2006)
  - Furthermore, the most effective interventions in reducing sexual risk behavior contained Informational, Motivational, and Behavioral Skills (IMB) components (Johnson et al., 2006)
Sample IMB Model Based Prevention for Positives Interventions

Physician-Based Intervention for Seropositives
J. Fisher, PI

Lay Counselor - Based Intervention for Seropositives
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Options: A Clinic-based PfP Intervention

- Options links PfP with routine clinical care, which can include both behavioral and biological elements that can impact the risk of HIV transmission.
Benefits of *Options* as a Clinic-based Prevention for Positives Intervention

- Enables access to large numbers of PLWH in care.
- **Behavioral aspects** of the intervention can be delivered by a variety of health care providers.
- **Biological aspects of the intervention** require a more highly trained health professional.
- *Options* allows patients to receive ongoing behavioral and biological PfP treatment over extended periods of time.
- *Options* has been shown to change levels of HIV risk behavior.
Next Generation of HIV Prevention for Positives Interventions

- HIV Testing
- Initiating ARVs
- ARV Adherence
- Prevention for Positives

Next Generation HIV Prevention for Positives Interventions
Possible *Future Directions* for Prevention for Positives Interventions

- Future PfP interventions will likely yield greater impact on the epidemic by addressing the unique interface of behavior *and* biology by including (Temoshok & Wald, 2008):
  
  - Behavioral approaches
    - Safe/safer sex, optimal ARV adherence, and reduction of substance use
  
  - Medical approaches to deal with biologic risk
    - Access to ARV, ARV monitoring, viral suppression, monitoring viral resistance, and co-morbid conditions
  
  - Integrate other services to address conditions that facilitate risk among PLWH
    - e.g., mental health, addiction, and family planning services
Possible *Future Directions* (continued)

- **Behavioral** PfP components need to be integrated into the current *structural* changes (global scale up of HIV testing and ARV rollout) and *biomedical* advances (ARVs and prophylaxis)
Possible *Future Directions* (continued)

- PfP needs to be conceptualized, in *research* and in *practice*, to include the core elements in the figure below, AND, critically, to ensure the links between them.
Possible *Future Directions* (continued)

- **Possible strategies to enhance the proposed linkages between these core elements**
  - *Test and Treat (TNT)* facilitating uptake of HIV Testing, early entry into care and aggressive early initiation of ARVS
  - Build in *health literacy* and *system navigation* components to facilitate linkage to care and ARV initiation
  - Enhance *patient self-management* skills to sustain adherence and maintenance of care
Possible *Future Directions* (continued)

- Expanding behavioral PfP interventions to meet the prevention needs of PLWH will require a much broader focus:
  - Implementing behavioral PfP into routine HIV medical care
  - Implementing behavioral PfP into other HIV support services
  - Cross-training providers to address both prevention and adherence, or provide linkages and intensive follow up

- PfP interventions need to be ongoing, not one time events, permitting them to respond to individual needs, as they change
Possible *Future Directions* (continued)

- **Finally, next generation PfP interventions need to be:**
  - Targeted to address any *behavioral* (e.g., risky sex, drug use, nonadherence) or *biological* element (e.g., inadequate ARV regimen, co-morbid conditions) or *their interaction*, which could affect infectivity to others (e.g., viral load, viral resistance).
  - Especially targeted to those who are highly infectious.
  - Widely disseminated and linked to other critical medical and social service practices.
  - Adapted, implemented, and evaluated to meet the resource constraints and culturally relevant behavioral and biologic prevention needs in developing nations, as HIV testing and ARV scale-ups gain momentum.
Summary:
Evidence for Reducing Risk of Transmission

- **HIV Testing**
  - Behavioral
  - Biological* 

- **HIV Care**
  - Behavioral**
  - Biological

- **Initiating ARVs**
  - Behavioral**
  - Biological

- **Traditional Prevention for Positives Interventions**
  - Behavioral
  - Biological**

- **ARV Adherence Interventions**
  - Behavioral**
  - Biological

- **Next Generation HIV Prevention for Positives Interventions**
  - Behavioral
  - Biological

**Legend**
- Red: Substantial evidence
- **: Emerging evidence
- *: Limited to no support.
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