Ending Sexual HIV Transmission: Lessons Learned from Perinatal HIV

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Data presented at the 2015 Conference on Retroviruses and Opportunistic Infections (February, Seattle, WA) confirmed that oral emtricitabine/tenofovir used as preexposure prophylaxis (PrEP) for HIV infection was highly effective. The Ipergay and PROUD studies both demonstrated an 86% reduction in HIV incidence in men who have sex with men randomized to receive active drug (McCormack & Dunn, 2015; Molina et al., 2015). The HPTN 067 ADAPT trial showed that high levels of PrEP adherence occurred in a sample of young women (Bekker et al., 2015). The Partners Demonstration Project revealed near elimination (96% reduction) of sexual HIV transmission with an integrated approach offering antiretroviral therapy (ART) for an HIV-infected partner and PrEP for an HIV-uninfected partner (Baeten et al., 2015). In that study, there were only two HIV transmissions and neither had detectable drug levels at the time of HIV acquisition. Surveillance from San Francisco demonstrated that PrEP was scaling up, with 10% to 15% of men who have sex with men already taking PrEP, and that PrEP uptake was highest in people who would benefit the most (Grant et al., 2015). The San Francisco modeling suggested that a reduction in HIV transmission would be possible with countywide scale-up of PrEP, with a further reduction in incidence and higher rates of viral suppression. It is time to widely disseminate an integrated treatment and prevention paradigm to end HIV transmission.

The success of perinatal HIV prevention highlights possibilities for consideration in the broader HIV epidemic. Widely heralded as one of the greatest public health successes in the United States, perinatal HIV transmissions declined from 1650 in 1991 to 151 by 2009, a greater than 90% reduction (Nesheim et al., 2012). Several interventions led to this success: (a) routine prenatal HIV screening, (b) rapid HIV testing during labor and delivery, (c) maternal ART and infant ART prophylaxis, and (d) infant replacement feeding. Vital work remains to maintain these successes and achieve the elimination of perinatally transmitted HIV (Nesheim, Harris, & Lampe, 2013).

While perinatal HIV prevention efforts have been unique, including a time-limited focus, special motivations to protect infants, and increased opportunities for intervention when pregnant women engage in care, some themes are shared by prevention of perinatal HIV transmission and sexual HIV transmission (Figure 1). Reviewing successes from perinatal HIV prevention can inform a collective strategy to end sexual HIV transmission (Table 1).

Integrated HIV Treatment and Prevention

The Perinatal HIV Prevention Cascade first proposed by the Institute of Medicine in 1998 (Stoto,

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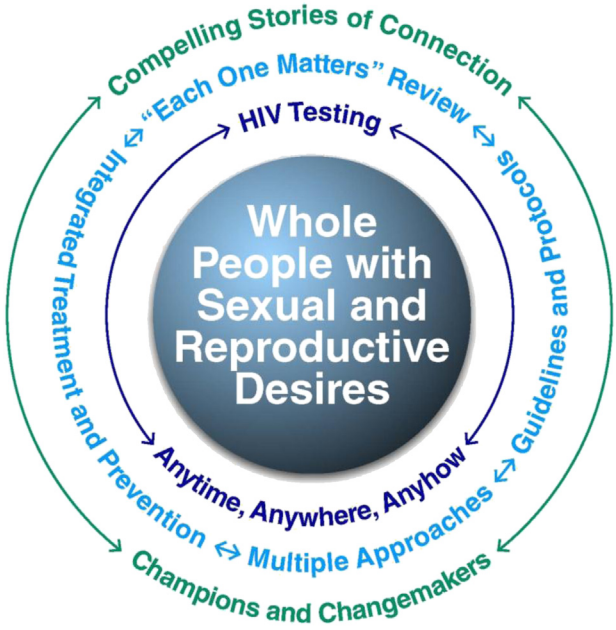

Figure 1. Ending sexual HIV transmission.

Almario, & McCormick, 1999) served as a guide for U.S. perinatal HIV stakeholders to develop the tools, interventions, and local infrastructure necessary to achieve a reduction in vertical HIV transmission. As knowledge evolved, the cascade was updated, integrating new technologies and interventions, providing a context for targeted efforts at national and local levels. In 2012, the Centers for Disease Control and Prevention (CDC) proposed a framework for the elimination of perinatal HIV transmission in the United States (Nesheim et al., 2012).

While the HIV treatment cascade has been widely discussed (Gardner, McLees, Steiner, Del Rio, & Burman, 2011) and the White House Executive Order on the HIV Care Continuum Initiative (White House Executive Order, 2013) began the broad conversation about gaps in the treatment cascade, these discussions did not include prevention components to fully realize the potential benefits of current behavioral and biomedical interventions. Treatment for prevention of perinatal HIV transmission necessarily combined with critical ancillary services for an integrated treatment and prevention approach. The successful elimination of sexual HIV transmission will most easily occur at the crossroads of treatment and prevention activities.

Embracing and Offering Multiple Approaches

The landmark AIDS Clinical Trials Group 076 trial demonstrated the benefits of reducing vertical transmission by providing zidovudine to pregnant women living with HIV and their HIV-exposed infants. The subsequent broad implementation of these findings dramatically decreased perinatal HIV transmission rates from 25% to 11% (Connor et al., 1994). Innovation is required to further reduce infections through routine HIV screening, access to prenatal care, and expanded and fully suppressive ART regimens.

Likewise, the end of sexual HIV transmission will require multiple approaches rather than championing one favored idea. Early treatment, pre- and postexposure prophylaxis, routine HIV testing, client-centered counseling, male and female condoms, serosorting (the adaptation of sexual practices based on HIV status), and negotiated safety all have important and complementary roles to play. Multiple ideas and people will foster an evolution of ideas and their dissemination.

Whole People With Reproductive and Sexual Desires

In 2002, the World Health Organization published a pioneering definition of sexual health:

> Sexual health is a state of physical emotional, mental, and social wellbeing in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. (World Health Organization, 2002, p. 5)

Consistent with this definition, the conversation in perinatal HIV shifted from prevention of vertical HIV transmission to a broader focus on women's health (Burr, Fry, Weber, Armas-Kolostroubis, & Lampe, 2009). Earlier identification of HIV, primary HIV prevention, preconception care, and safe conception options became priorities. Extending reproductive