

The Evidence for U=U

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Undetectable=Untransmittable Outline

- ▶ Review of the Science
 - ▶ What are the origins of U=U?
 - ▶ Prior to antiretroviral therapy (ART), how did we learn lower viral load = lower risk?
 - ▶ What supports starting ART to lower transmission risk?
 - ▶ What supports U=U in the real world?
 - ▶ What supports U=U in MSM?
- ▶ Frequently Asked Questions

What Are the Origins of U=U?

1998:
**Studies of HIV
transmission from
mother to baby: 0
transmissions
when on ART**

Beckman et al (Int Conf AIDS
1998)

1998:
**U.S. guidelines
include “possibly
decreasing
transmission” as
rationale for
starting ART**

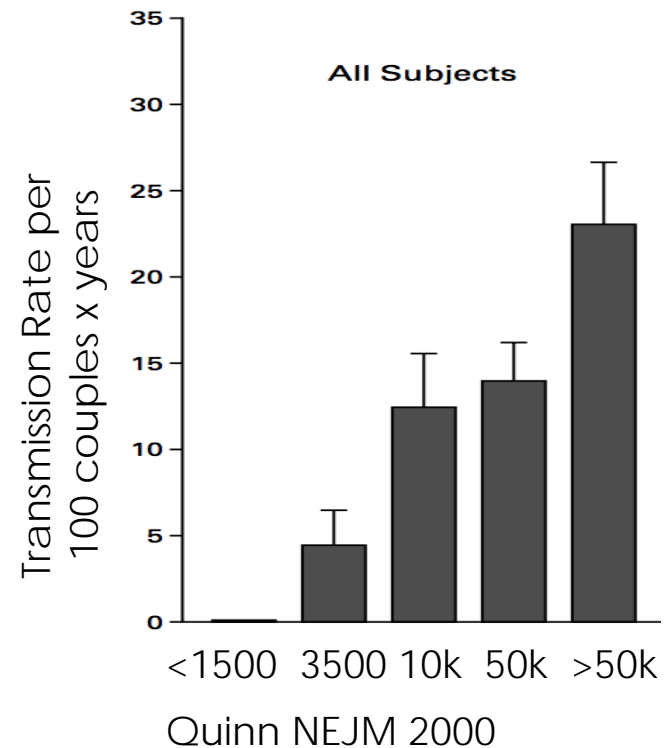
DHHS guidelines 1998

2000:
**Study of HIV
transmission in
sero-different
partners in
Uganda**

Quinn et al 2000

2000: Without Antiretroviral therapy No Transmissions When Viral Load <1500

- 415 couples in Uganda studied for up to 30 months
- Lower viral load, lower risk
- No transmissions when viral load was <1500



What Supports Starting Antiretroviral Therapy to Lower Risk?

2001- 2008: Swiss Commission Statement summarizing observational trials: "Suppressed does not transmit" (with caveats)
Vernazza et al 2008

2011: Large Randomized Trial: Starting Antiretroviral Therapy to Decrease HIV Infection (HPTN 052)
Cohen et al. NEJM 2011

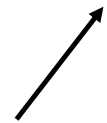
2015: Final Analysis Of Same Trial (HPTN 052)
Cohen et al. IAS 2015
Cohen et al. NEJM 2016



2011: Antiretroviral Therapy Decreases HIV Transmission in a Randomized Trial (HPTN 052)

U
=
U

Sexually-Active
Sero-Different Couples
with CD4 Count 350-550
(1763 couples)



Immediate ART Arm
(886 couples)



Delayed ART Arm
(877 couples)



Fewer HIV-related
Clinical Events



Fewer HIV
Transmissions

2015: Final Analysis of HPTN 052-- No Transmissions If Undetectable

- 36% of transmissions occurred outside of partnership (“unlinked”)
- No “linked” transmissions when partner on ART 3 months and virally suppressed
- Caveats: ~0 MSM, High Condom Use

8 Transmissions when
Partner on ART

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graph TD; A[8 Transmissions when Partner on ART] --> B[4: Partner Had Treatment Failure]; A --> C[4: Partner Had Started ART within 90 Days];
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4: Partner Had
Treatment Failure

4: Partner Had
Started ART
within 90 Days

2016-2017: What supports U=U in the Real World and in MSM?

Study	Population	<u>Condomless</u> Sex Acts	Transmissions within Partnership
PARTNER	888 couples, 38% MSM	58,000	0
Opposites Attract	343 couples, 100% MSM	17,000	0

Rodger et al. JAMA 2016; 316: 171-81
Bavinton et al, IAS 2017: TUAC0506LB

#UequalsU

- ▶ **"The science really does verify and validate U=U."** Anthony S. Fauci, M.D., Director, NIAID, NIH [Speech at United States Conference on AIDS](#) (September, 2017)
- ▶ **"People who take ART daily as prescribed and achieve and maintain an undetectable viral load have effectively no risk of sexually transmitting the virus to an HIV-negative partner."** CDC (September, 2017)
- ▶ **"It is time, to end the fears!" "I really think these community members who were active on U=U did a great job."** Pietro Vernazza, author of Swiss Commission Statement (November, 2017)

FAQ: U=U

- ▶ How long after starting antiretroviral therapy does U=U?
- ▶ What if you or a partner misses doses or stops therapy?
- ▶ What about sexually transmitted infections (STIs)?
- ▶ What about people with injection drug use?

How Long After Starting ART Is Safe?: No Infections After 6 Months in Partners-PrEP

- ▶ Randomized, placebo-controlled trial in sero-different heterosexual partners with partner starting ART
 - ▶ 3 infections in first six months vs. 0 after six months
- ▶ 6 Months May Be Conservative
 - ▶ Older HIV Regimens
 - ▶ No Infections after 90 days in HPTN 052

What If I/My Partner Misses Doses Or Stops Antiretroviral Therapy (ART)?

- ▶ When do people become detectable off ART?
 - ▶ Risk increases significantly after one week (2x odds).
 - ▶ Can be as soon as 48hrs (Genberg et al. AIDS 2012)
 - ▶ Risk of transmission is still very low if only missing several days
- ▶ If you/partner stops for longer than several days:
 - ▶ Other prevention strategies remain available: PrEP, condoms
 - ▶ Continue until undetectable

What Do We Know about Sexually Transmitted Infections? Injection Drug Use ?

- ▶ Sexually Transmitted Infections:
 - ▶ No transmissions if undetectable (6-17% with STIs in PARTNER)
(Rodgers et al. JAMA 2016; 316: 171-81)
- ▶ Injection Drug Use:
 - ▶ Limited data (only 2% with injection drug use in PARTNER)
 - ▶ PrEP is effective for prevention (Choopanya K. et al. Lancet 2013)



U=U

UNDETECTABLE = UNTRANSMITTABLE

Additional Slides

Some Patients Linked to Care Are Not Always Suppressed

- ▶ ~14,500 patients at 6 HIV clinics in the U.S. followed 3 years
- ▶ 90% were Prescribed ART
- ▶ Half of patients had 1 or more viral loads >1,500 copies
 - ▶ ¼ of study person-time