Human Immunodeficiency Virus (HIV) Risk Assessment: Pre/Post Exposure Prophylaxis & Current HIV Testing

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Disclosures

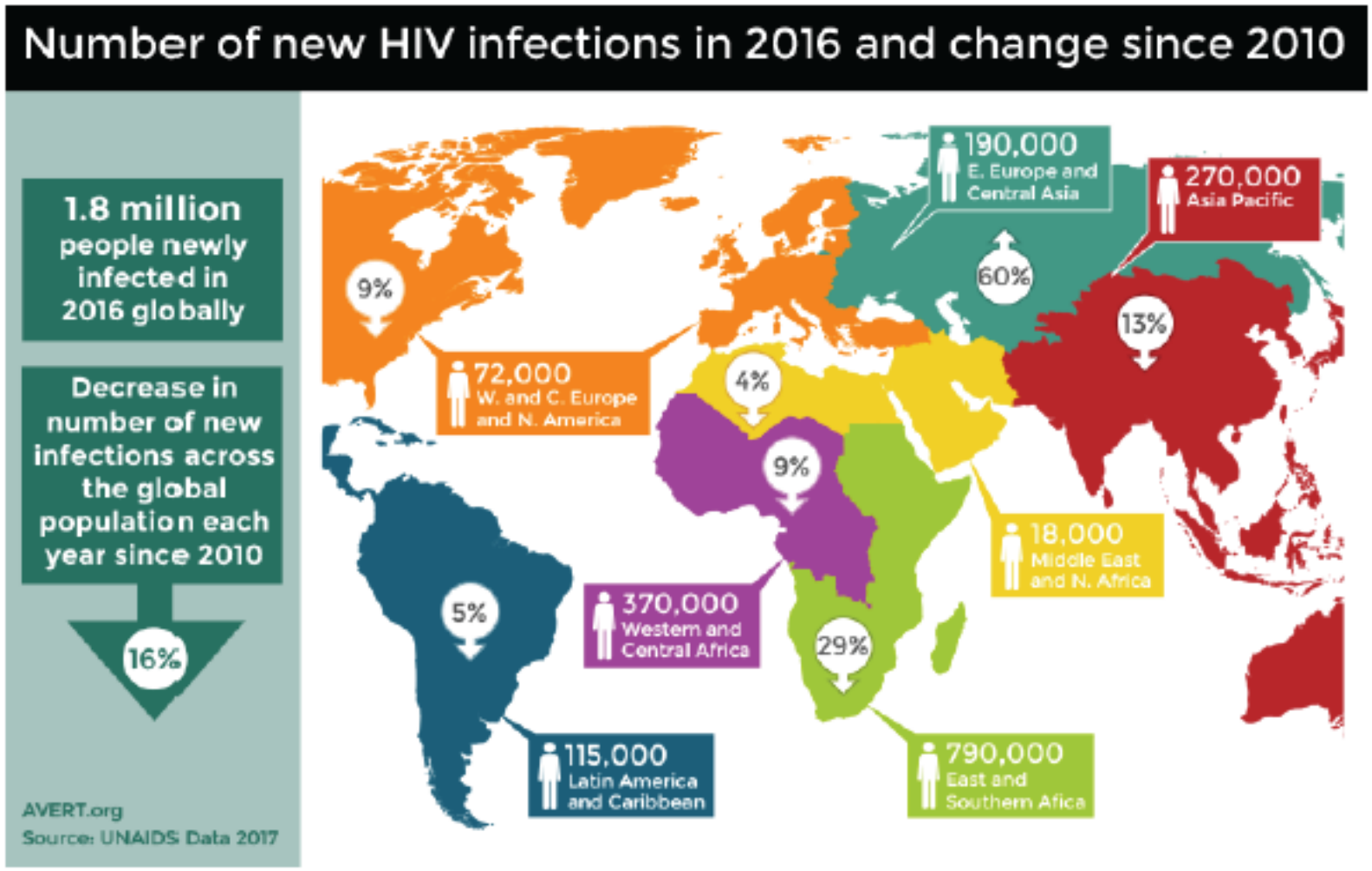
- Double Boarded & Actively Practicing in
  Internal Medicine & Infectious Diseases
- National Perspective: Training at Yale, Harvard, Dartmouth, Princeton, U of Tennessee, China CDC
- Primarily a HIV and Hepatitis C Provider
- Innovate U.S. and FL HIV and HCV testing & treatment
- Rotate on studies at USF Clinical Trials Unit
- Not funded by laboratory or testing agencies
- Questions welcome at end of presentation

Objectives

1) Current HIV Epidemiology
2) Current HIV Screening Guidelines
3) Current HIV Testing & Reliability
4) HIV Pre-Exposure Prophylaxis (PrEP)
5) HIV non-occupational PEP (nPEP)
6) Occupational Post-Exposure Prophylaxis (oPEP)
7) HIV Occupational Exposure Guidelines

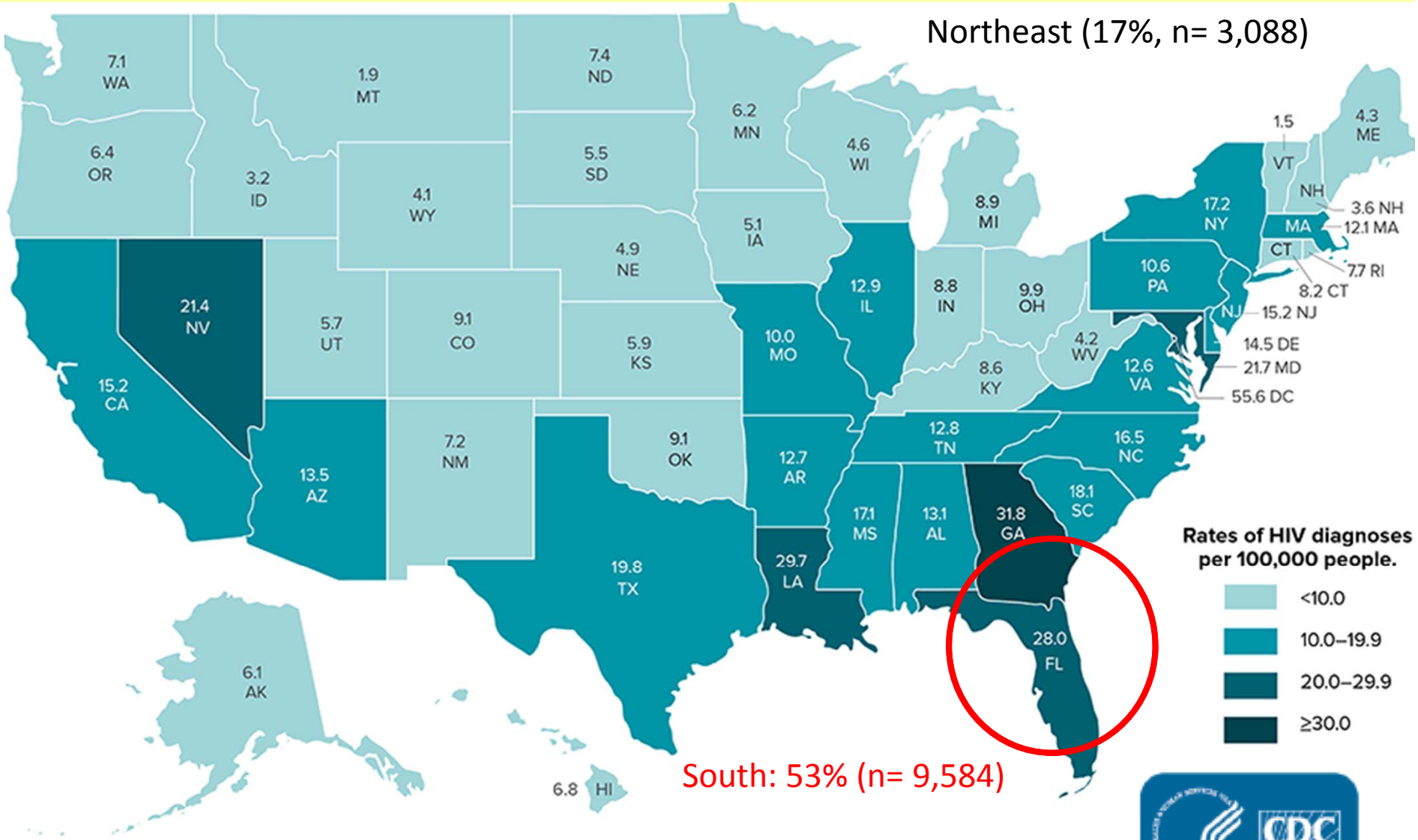
Objective #1:
HIV Epidemiology

HIV Epidemiology: Global Context



World Health Organization estimates 36.7 million persons living with HIV globally in 2016.

Rates of New HIV Diagnoses Among Adults and Adolescents in the US by State, 2016, Total Incidence 18,160; Total Prevalence 1.2 million

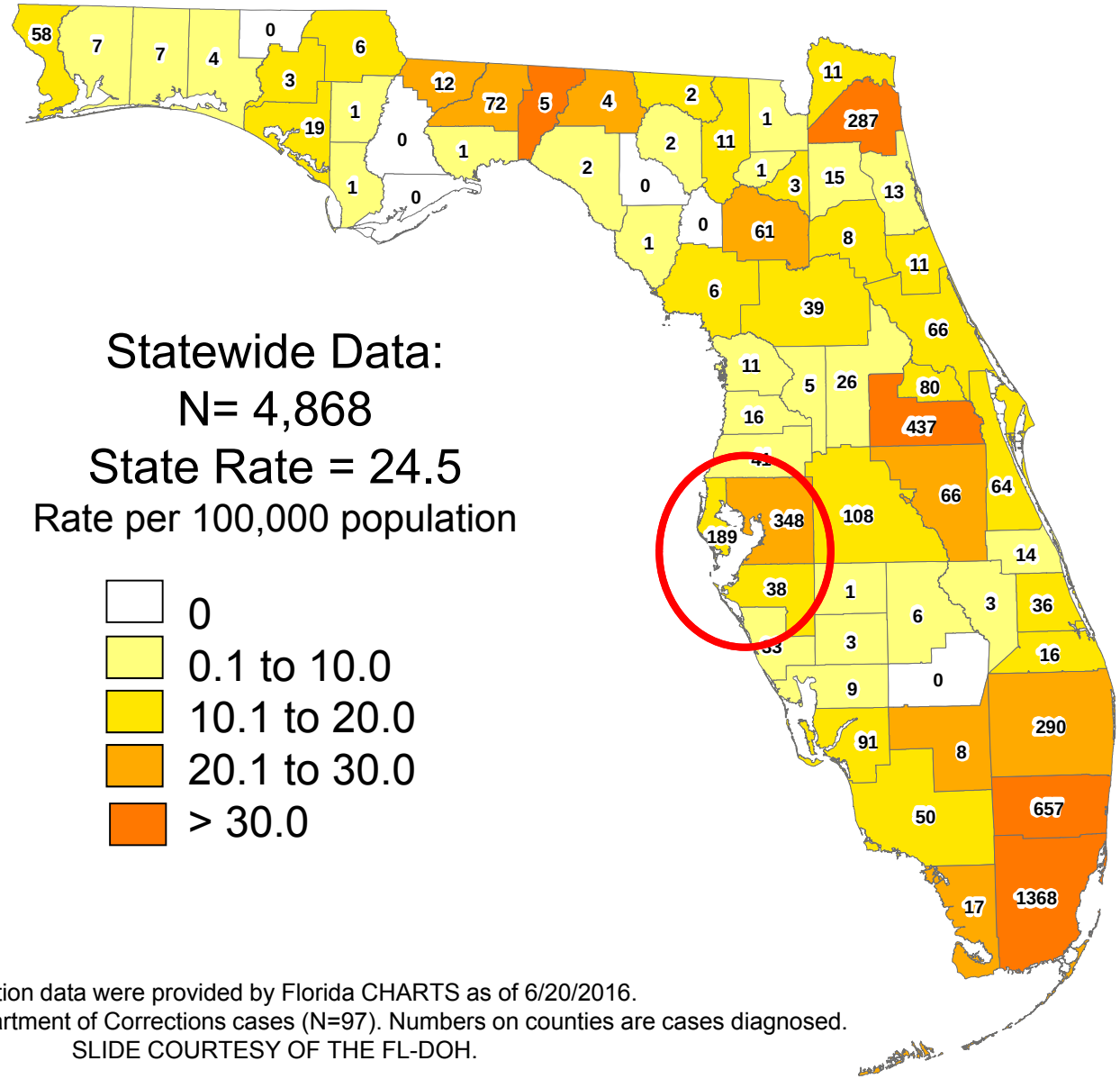


Source: https://www.cdc.gov/hiv/statistics/overview/geographicdistribution.html, Accessed 12/1/17
CDC HIV Surveillance Report 2016; 28.

New Diagnoses in the US by Race/Ethnicity and Region of Residence, 2016

Source: https://www.cdc.gov/hiv/statistics/overview/geographicdistribution.html, Accessed 12/1/17
CDC HIV Surveillance Report 2016; 28.

HIV Infection Case Rates[1] by County of Residence[2] Diagnosed in 2015, Florida



Statewide Data:
N= 4,868
State Rate = 24.5
Rate per 100,000 population

- 0
- 0.1 to 10.0
- 10.1 to 20.0
- 20.1 to 30.0
- > 30.0

[1]Population data were provided by Florida CHARTS as of 6/20/2016.
[2]County totals exclude Department of Corrections cases (N=97). Numbers on counties are cases diagnosed.
SLIDE COURTESY OF THE FL-DOH.

Objective #2:
HIV Screening Guidelines

HIV Screening Guidelines

- Question: Whom to Test?
- Answer: Everyone. More frequently if more risk factors or in high prevalence area.

HIV Screening Guidelines (2017)

Category	Risk Factors	Screening Interval
General Population	• Age 13-64 years (CDC, 2006) § • Age 15-65 years (USPSTF, 2013) ¶	Once Lifetime
High Risk Heterosexual Population	• Unprotected Anal or Vaginal Intercourse • Sex Partners Who Use Injection Drugs or are Bisexual / MSM • Exchanging Sex for Drugs or Money • Partner who is HIV+ (USPSTF, 2013) ¶	Annually

§ Source: DiNenno EA, Prejean J, Irwin K, et al. Recommendations for HIV Screening of Gay, Bisexual, and Other Men Who Have Sex with Men — United States, 2017. MMWR Morb Mortal Wkly Rep 2017;66:830–832.

¶ Source: Moyer et al. Screening for HIV: United States Preventative Services Task Force (USPSTF) Recommendation Statement. Annals Internal Medicine, 2013, 159. 51-60.

HIV Screening Guidelines (2017)

Category	Risk Factors	Screening Interval
MSM or Bisexual Men	Active MSM, Gay, or Bisexual Men	Annually (CDC, 2006) § (USPSTF, 2013) ¶
	High Risk MSM, M to F Transgender, Sex Workers	Every 3-6 Months (CDC Enhanced)
On Pre-Exposure Prophylaxis (PrEP)	MSM, Bisexual, M to F Transgender, High Risk Heterosexual	Every 3 Months (CDC, 2014)*

§ Source: DiNenno EA, Prejean J, Irwin K, et al. Recommendations for HIV Screening of Gay, Bisexual, and Other Men Who Have Sex with Men — United States, 2017. MMWR Morb Mortal Wkly Rep 2017;66:830–832.

¶ Source: Moyer et al. Screening for HIV: United States Preventative Services Task Force (USPSTF) Recommendation Statement. Annals Internal Medicine, 2013, 159. 51-60.

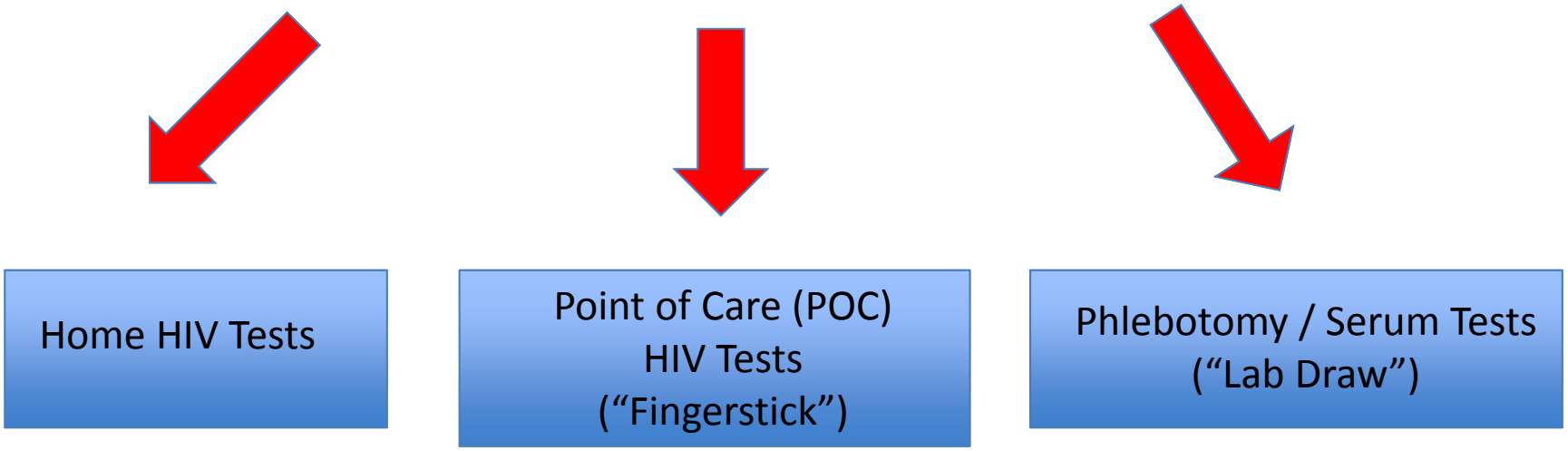
* Source: Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guideline, Centers for Disease Control and Prevention US Public Health Service. 2014.

HIV Screening Guidelines (2017)

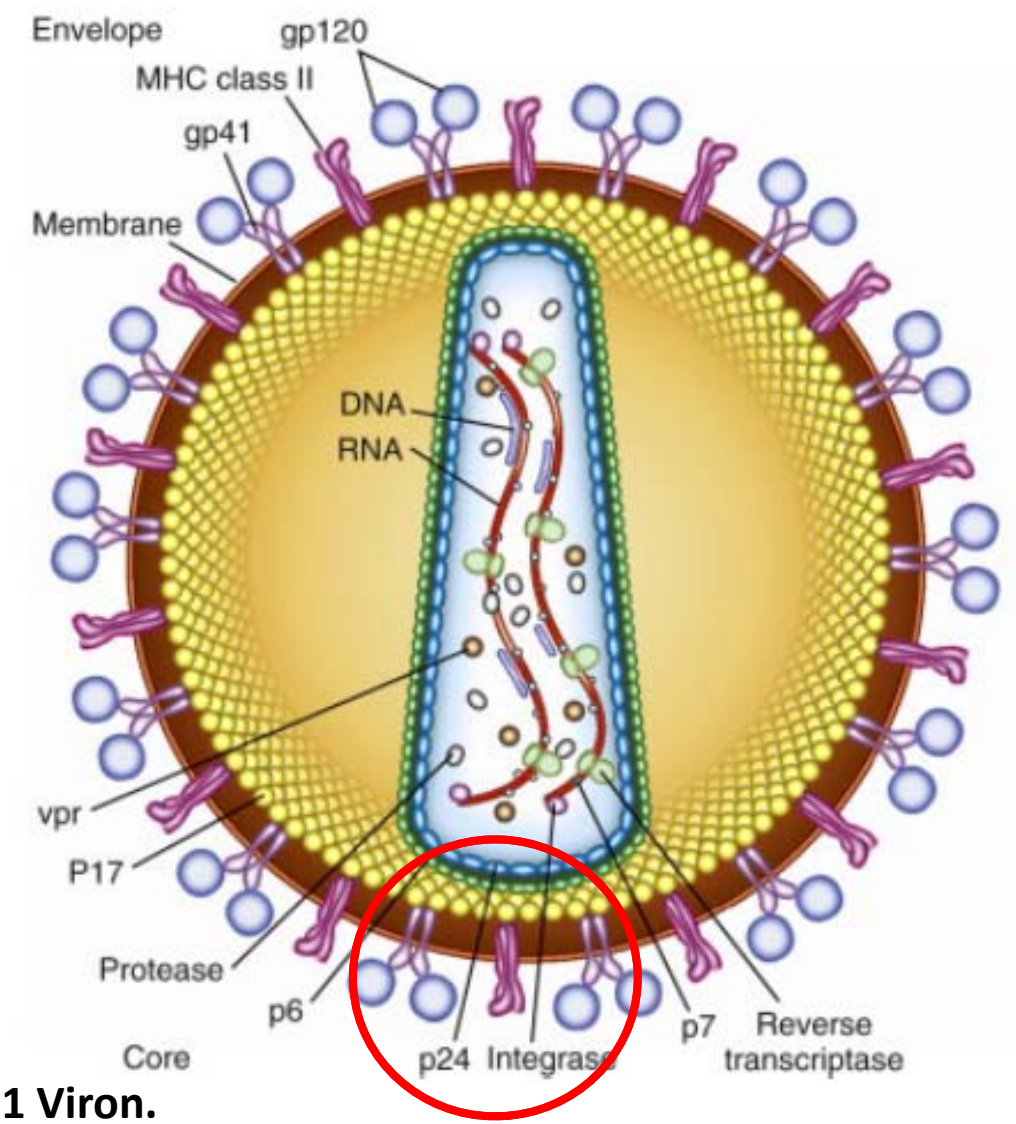
Category	Risk Factors	Screening Interval
Women in Pregnancy	Pregnancy, Mandatory (USPSTF, 2013) ¶	Once During Pregnancy *(even if first clinical presentation is during labor)*
People Who Inject Drugs (PWID)	Any type of intravenous drug use, even once	Annually ¶ (Expert Opinion) Also offer HCV Testing
Incarcerated Populations		Upon Incarceration and After Release (Expert Opinion) Also Offer HCV Testing

¶ Source: Moyer et al. Screening for HIV: United States Preventative Services Task Force (USPSTF) Recommendation Statement. Annals Internal Medicine, 2013, 159. 51-60.

Objective #3:
HIV Testing Guideline Updates



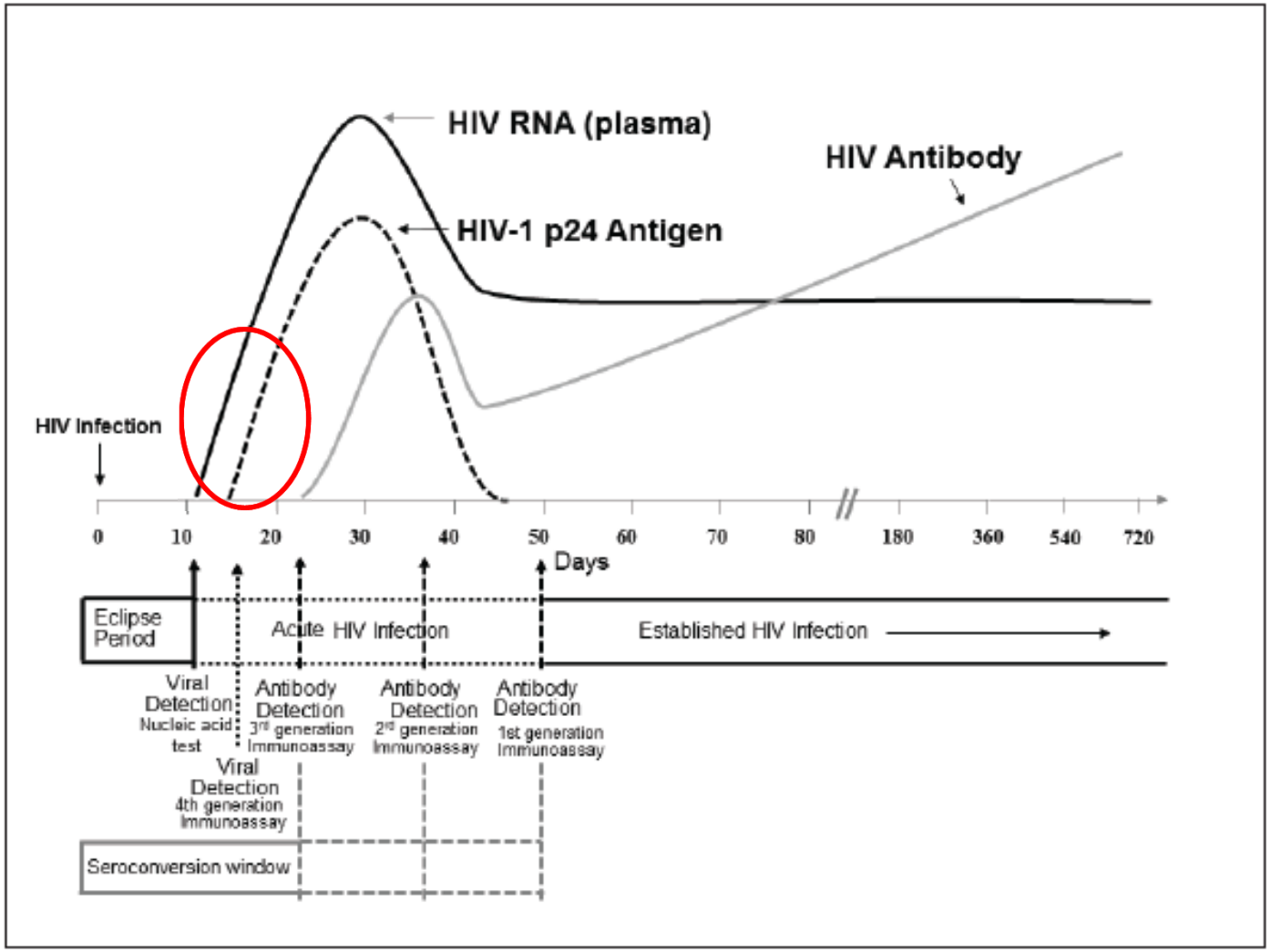
HIV Virion



Structure of HIV-1 Viron.

Source: Mandell's *Principles and Practice of Infectious Diseases*, 2010.

Figure 1. Sequence of appearance of laboratory markers for HIV-1 infection



Note. Units for vertical axis are not noted because their magnitude differs for RNA, p24 antigen, and antibody. Modified from MP Busch, GA Satten (1997)[50] with updated data from Fiebig (2003),[48] Owen (2008),[49] and Masciotra (2011, 2013).[46,66]

USF HEALTH

FDA Approved Home HIV Tests

Tradename	Infectious Agent	Accuracy	Specimen	Use	Manufacturer	Approval Date
Home Access HIV-1 Test System	HIV-1	100% sensitive 100% specific	Dried Blood Spot	• In Vitro Diagnostic • Anonymous • Mail Sample • Call for Results in **3-7 days**	Home Access Health Corp., Hoffman Estates, IL	7/22/1996
OraSure HIV-1 Oral Specimen Collection Device	HIV-1		Oral Fluid	For Use with HIV diagnostic assays that have been approved for use with this device.	OraSure Technologies Bethlehem, PA	12/23/1994
OraQuick In-Home HIV Test	HIV-1, HIV-2	91.7% sensitive 99.9% specific	Oral Fluid	• Results at home in **20 minutes** • Still need confirmatory testing	OraSure Technologies Bethlehem, PA	07/03/2012

CAUTION: Need to be HIV infected for **3-6 months** to become reactive with these tests.
Do NOT use if concern for acute HIV infection.

Adapted from
https://www.fda.gov/BiologicsBloodVaccines/BloodBloodProducts/ApprovedProducts/LicensedProductsBLAs/BloodDonorScreening/InfectiousDisease/ucm080466.htm#anti_HIV1_Assays, February 19, 2018

Point of Care (POC) HIV Tests

Alere Determine™ HIV-1/2 Ag/Ab Combo	HIV-1, HIV-2	**Immunoassay**	**Fingerstick & Venipuncture of Whole Blood; Serum; Plasma**	In Vitro Diagnostic: **Simultaneous qualitative detection of HIV p24 antigen and antibodies to HIV-1 and/or HIV-2; point-of-care test.**	Alere Scarborough, Inc. Scarborough, ME	8/8/2013
OraQuick ADVANCE Rapid HIV-1/2 Antibody Test	HIV-1, HIV-2	**Rapid Immunoassay**	**Oral Fluid; Fingerstick & Venipuncture of Whole Blood; Serum; Plasma**	In Vitro Diagnostic: **Qualitative detection of antibodies to HIV-1** and/or HIV-2; point-of-care test.	OraSure Technologies Bethlehem, PA	11/7/2002 6/22/2004

Adapted from https://www.fda.gov/BiologicsBloodVaccines/BloodBloodProducts/ApprovedProducts/LicensedProductsBLAs/BloodDonorScreening/InfectiousDisease/ucm080466.htm#anti_HIV1_Assays, February 19, 2018

Point of Care (POC) HIV Tests

OraSure HIV-1 Western Blot Kit	HIV-1	**WB**	**Oral Fluid**	Diagnostic Supplemental: Qualitative detection of antibodies to HIV-1 for use as an **additional, more specific test in oral fluid specimens** found to be repeatedly reactive by the Oral Fluid Vironostika HIV-I Microelisa System.	OraSure Technologies Bethlehem, PA	6/3/1996
INSTI HIV-1/HIV-2 Antibody Test	HIV-1, HIV-2	Rapid Immunoassay	**Fingerstick & Venipuncture of Whole Blood; Plasma**	In Vitro Diagnostic: Qualitative detection of antibodies to HIV-1.	bioLytical Laboratories Inc. British Columbia, Canada	1/28/2015

Adapted from https://www.fda.gov/BiologicsBloodVaccines/BloodBloodProducts/ApprovedProducts/LicensedProductsBLAs/BloodDonorScreening/InfectiousDisease/ucm080466.htm#anti_HIV1_Assays, February 19, 2018

Point of Care (POC) HIV Tests

Uni-Gold™ Recombigen® HIV-1/2	HIV-1, HIV-2	Rapid EIA	**Fingerstick & Venipuncture of Whole Blood; Plasma**	In Vitro Diagnostic: Qualitative detection of antibodies to HIV-1 and/or HIV-2; point-of-care test.	Trinity Biotech Jamestown, NY	12/23/2003 02/04/2013
SURE CHECK HIV 1/2 ASSAY	HIV-1, HIV-2	Rapid Immunoassay	**Fingerstick & Venipuncture of Whole Blood; Plasma; Serum**	In Vitro Diagnostic: Qualitative detection of antibodies to HIV-1 and/or HIV-2; point-of-care test.	Chembio Diagnostic Systems, Inc. Medford, NY	5/25/2006
HIV 1/2 STAT-PAK ASSAY	HIV-1, HIV-2	Rapid Immunoassay	**Fingerstick & Venipuncture of Whole Blood; Plasma; Serum**	In Vitro Diagnostic: Qualitative detection of antibodies to HIV-1 and/or HIV-2; point-of-care test.	Chembio Diagnostic Systems, Inc. Medford, NY	5/25/2006

Adapted from https://www.fda.gov/BiologicsBloodVaccines/BloodBloodProducts/ApprovedProducts/LicensedProductsBLAs/BloodDonorScreening/InfectiousDisease/ucm080466.htm#anti_HIV1_Assays, February 19, 2018

Point of Care (POC) HIV Tests

Chembio DPP® HIV 1/2 Assay	HIV-1, HIV-2	Rapid Immuno-chromatographic Assay	Oral Fluid, Fingerstick & Venipuncture of Whole Blood; Plasma; Serum	In Vitro Diagnostic: Qualitative detection of antibodies to HIV-1 and/or HIV-2; point-of-care test.	Chembio Diagnostic Systems, Inc. Medford, NY	12/19/2012

CAUTION: Point of Care Tests Excellent for On Site Counseling and Linkage to Care.
Do NOT use if concern for acute HIV infection.

Need Nucleic Acid Amplification Test (NAT) Test for HIV Viral Load if concern for acute HIV Infection.

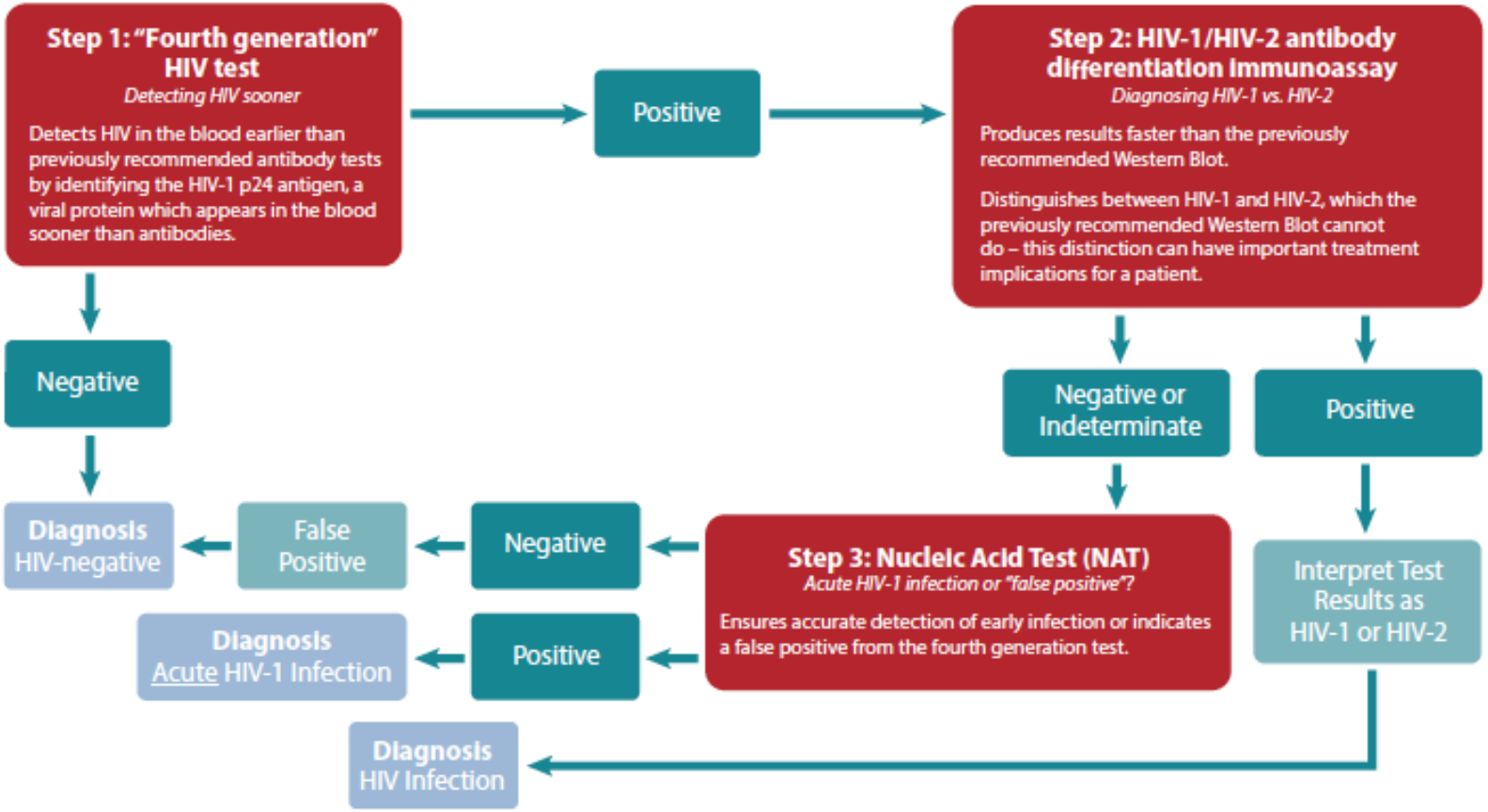
Adapted from
https://www.fda.gov/BiologicsBloodVaccines/BloodBloodProducts/ApprovedProducts/LicensedProductsBLAs/BloodDonorScreening/InfectiousDisease/ucm080466.htm#anti_HIV1_Assays, February 19, 2018

New CDC Recommendations for HIV Testing in Laboratories

A step-by-step account of the approach

CDC's new recommendations for HIV testing in laboratories capitalize on the latest available technologies to help diagnose HIV infections earlier – as much as 3-4 weeks sooner than the previous testing approach. Early diagnosis is critical since many new infections are transmitted by people in the earliest ("acute") stage of infection.

By putting the latest testing technology to work in laboratories across the United States, we can help address a critical gap in the nation's HIV prevention efforts.



This graphic is designed to illustrate key concepts of the new testing approach in laboratories. For more detail, please see the full guidelines here: http://www.cdc.gov/hiv/pdf/HIVtestingAlgorithmRecommendation-Final.pdf.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

www.cdc.gov/nchhstp/newsroom

JUNE 2014

Table 2. FDA-approved assays included in evidence synthesis

Assay class	Trade name (Manufacturer)	Abbreviation used in evidence tables
HIV-1/HIV/2 immunoassay "3rd generation"	Advia Centaur HIV 1/O/2 Enhanced (Siemens Healthcare Diagnostics, Malvern, PA)	Advia
	GS HIV-1/HIV-2 *PLUS O* EIA (Bio-Rad Laboratories, Redmond, WA)	GS Plus O
	Vitros Anti-HIV 1+2 Assay (Ortho Clinical Diagnostics, Rochester, NY)	Vitros
HIV/1-HIV/2 antigen/antibody combination immunoassay "4th generation"[a]	Architect HIV Ag/Ab Combo (Abbott Laboratories, Abbott Park, IL)	Architect Ag/Ab
	GS HIV Combo Ag/Ab EIA (Bio-Rad Laboratories, Redmond, WA)	GS Ag/Ab
HI[illegible]estern H[illegible]	GS HIV-1 Western Blot (Bio-Rad Laboratories, Redmond, WA)	WB
	Cambridge Biotech HIV-1 Serum Western Blot (Maxim Biomedical, Inc. Rockville, MD)	WB
HIV [illegible]IV-2 diffe[illegible]uation assay	Multispot HIV-1/HIV-0 Rapid Test (Bio-Rad Laboratories, Redmond, WA)	Multispot
HIV-1 nucleic acid amplification test[b]	APTIMA HIV-1 RNA Qualitative Assay (Hologic Gen-Probe Inc., San Diego, CA)	APTIMA
	Procleix Ultrio (Novartis Diagnostics, Cambridge, MA)	Procleix

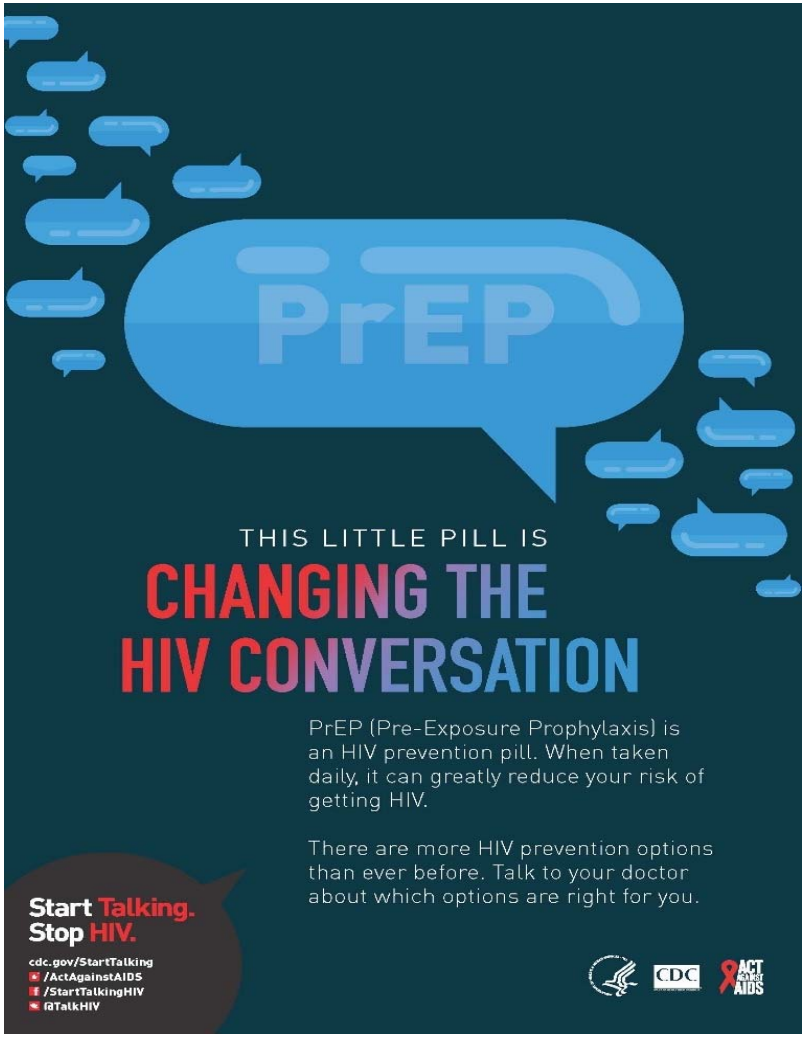
[a] The Determine HIV 1-2 Ag/Ab Combo rapid test, approved by the FDA in August 2013, was not included in the evidence synthesis because there were no studies evaluating its performance as part of the algorithm.

[b] APTIMA, FDA-approved for HIV diagnosis, and Procleix Ultrio, FDA-licensed for screening blood donations, are two brand names for the same qualitative RNA assay.

Objective #4:
HIV Pre-exposure Prophylaxis

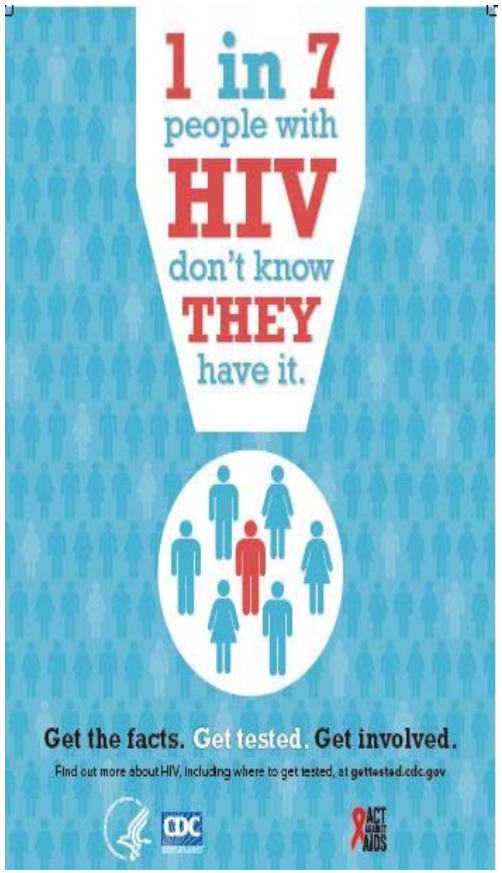
PrEP Pointers

- What is HIV PrEP?
- Does HIV PrEP Work?
- HIV PrEP in Substance Use Disorders (SUD)
- Is HIV PrEP Sustainable?
- To PrEP or Not to PrEP?



HIV Pre-Exposure Prophylaxis (PrEP)

- Single pill regimen taken by HIV-uninfected individual prior to potential HIV exposure
- Truvada®, approved by FDA in 2012
- Goal is to reduce risk of acquiring HIV infection
- Combine with **risk reduction**: safer sex counseling, condoms distribution, mental health services, sexually transmitted infection diagnosis and treatment, needle/syringe exchange, opioid replacement



Graphic Courtesy of Dr. Minh Ho 2017, adapted with permission

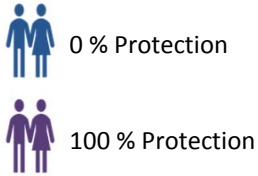
The “Other Little Blue Pill”

- **Truvada**® (TDF/FTC), one pill daily
- Tenofovir disoproxil fumarate (TDF) 300mg + Emtricitabine (FTC) 200mg

HIV PrEP

- Renew every 90 days supply with proper clinical visit follow-up
- Bone/Renal Effects Minimal
- **Creatinine Clearance Must > 60 ml/min**
- Tenofovir alafenamide (TAF) currently NOT approved for PrEP

PrEP Efficacy in MSM



iPrEX[1]
44% (95% CI, 15-63%)
(TDF/FTC)
N = 2499

- Phase 3, RCT, double blind, placebo controlled done in Peru, Ecuador, Brazil, Thailand, South Africa and US among MSM & Male to Female Transgender
- Subset analysis of those with detectable levels of TDF/FTC showed 92% reduction in risk of HIV acquisition (95% CI, 40-99)

PROUD[6]
86% (95% CI, 64-96%)
(TDF/FTC)
N = 544

- Phase 3, RCT, open label done in England
- Looked at immediate vs deferred for 12 months
- HIV incidence
  - Deferred 9.0/100 py vs 1.2/100 py
- NNT to prevent 1 infection: 13

1. Grant RM, et al. N Engl J Med. 2010;363:2587-2599. 2. Baeten JM, et al. N Engl J Med. 2012;367:399-410. 3. Thigpen MC, et al. N Engl J Med. 2012;367:423-434. 4. Choopanya K, et al. Lancet. 2013;381:2083-2090. 5. Van Damme L, et al. N Engl J Med. 2012;367:411-422. 6. Marrazzo JM, et al. N Engl J Med. 2015;372:509-518. 7. **McCormack S, et al. Lancet. 2016;387:53-60.**

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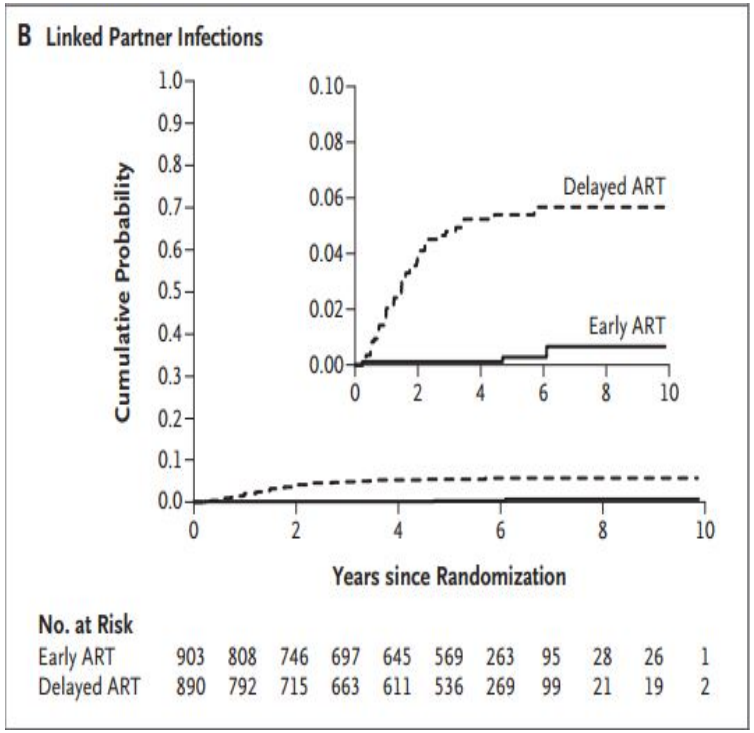
Treatment as Prevention: Serodiscordant Couples

HPTN 052[1]: 93% lower risk of linked partner infection in early vs delayed



The Partners Study[2]

- Observational study, N=888 in sero-discordant couples with HIV-infected partner on suppressive antiretroviral therapy (ART) and no condoms used
- Median follow-up: 1.3 yrs, ~58, 000 sex acts
- No linked transmission recorded in any couple

1. Cohen MS, et al. N Engl J Med. 2016;375:830-839. 2. Rodger A, et al. JAMA. 2016;316:171-181.

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PrEP Efficacy: Heterosexuals

Partners PrEP[2]
75% (95% CI 55-87%) (TDF/FTC)
67% (95% CI 44-81%) (TDF)
N = 4747

- RCT, double-blind, placebo controlled done in Kenya & Uganda in HIV-discordant couples with HIV+ partner not receiving ART
- High adherence rate, 98% by pills dispensed, 92% by pill count, 82% by drug level monitoring
- Women 71% (p=0.002) TDF & 66% (p=0.005) for TDF/FTC
- Men 63% (p=0.01) TDF & 84% (p<0.001) for TDF/FTC
- Subanalysis with detectable drug level in TDF/FTC patients showed 90% reduction in risk of HIV acquisition

TDF2[3]
62% (95% CI 22-83%) (TDF/FTC)
N = 1219

0 % Protection

100 % Protection

- Phase 2, RCT double-blind, placebo controlled done in Botswana
- Low compliance with study visit, 33% did not complete study per protocol

1. Grant RM, et al. N Engl J Med. 2010;363:2587-2599. 2. Baeten JM, et al. N Engl J Med. 2012;367:399-410. 3. Thigpen MC, et al. N Engl J Med. 2012;367:423-434. 4. Choopanya K, et al. Lancet. 2013;381:2083-2090. 5. Van Damme L, et al. N Engl J Med. 2012;367:411-422. 6. Marrazzo JM, et al. N Engl J Med. 2015;372:509-518. 7. **McCormack S, et al. Lancet. 2016;387:53-60.**

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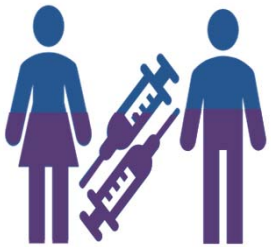
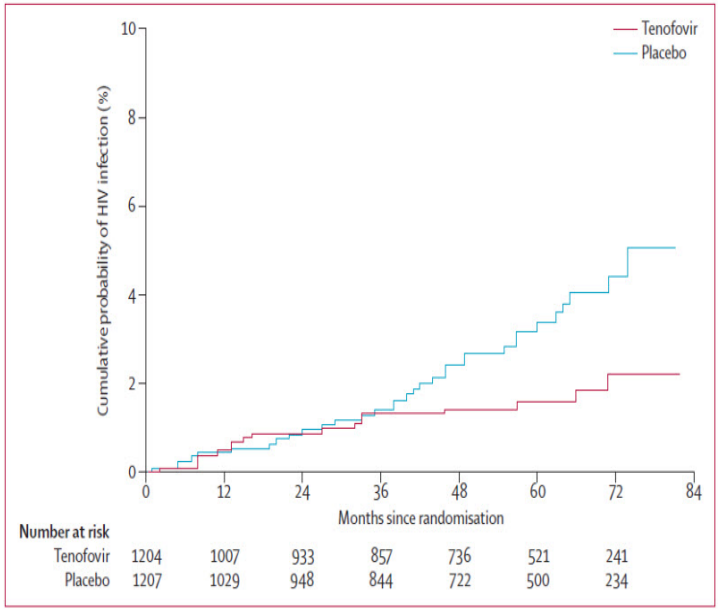
PrEP Efficacy: PWID (People Who Inject Drugs)



Bangkok Tenofovir Study[4]
49%
(TDF)
N = 2413



- RCT, Double blind, placebo controlled study in Bangkok, Thailand
- Conducted at 17 drug treatment clinics
- 22% received methadone at baseline
- TDF Qdaily (n=1024) vs Placebo (n=1209)
- In patients with detectable TDF: reduction of 73.5% (16.6% to 94%, P=0.03)

1. Grant RM, et al. N Engl J Med. 2010;363:2587-2599. 2. Baeten JM, et al. N Engl J Med. 2012;367:399-410. 3. Thigpen MC, et al. N Engl J Med. 2012;367:423-434. 4. Choopanya K, et al. Lancet. 2013;381:2083-2090. 5. Van Damme L, et al. N Engl J Med. 2012;367:411-422. 6. Marrazzo JM, et al. N Engl J Med. 2015;372:509-518. 7. **McCormack S, et al. Lancet. 2016;387:53-60.**

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HIV PrEP Efficacy by Frequency of Administration

0 % Protection

100 % Protection

2 doses 76%

4 doses 96%

7 doses 99%

HIV-1 risk reduction based on doses per week [1]

- STRAND study administered oral TDF to 24 HIV-negative adults
- 6 weeks of 2, 4 or 7 doses per week
- This measured expected blood level
- Then compared it to iPrEx data

"On Demand PrEP"

IPERGAY[2]
86%
(95% CI 40-98%
(TDF/FTC)
N = 400

•Median 15 pills per month
•Adherence 86%

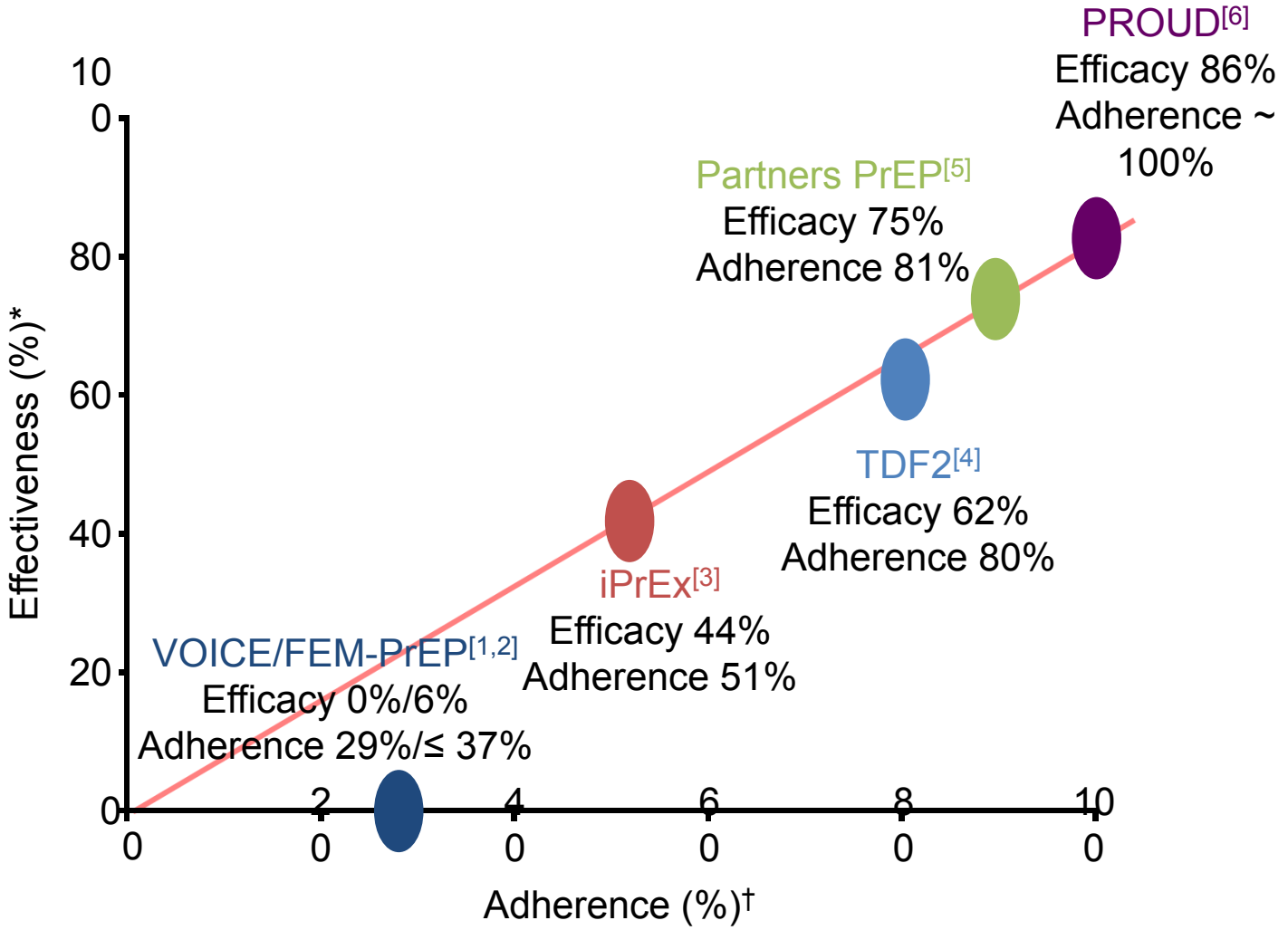
•First dose: two pills (taken at the same time) between two and 24 hours before sex
•Second dose: one pill taken 24 hours after the first dose
•Third dose: a final pill taken 24 hours after the second dose

- Double-blind, RCT, event-driven in high risk MSM done in France and Canada
- Plasma TDF detected in 86% of pts in PrEP
- Event driven PrEP strategy not FDA approved

1. Anderson PL, et al. Sci Transl Med. 2012;4(151). 2. Molina JM, et al. N Engl J Med 2015; 373:2237-2246

Slide Courtesy of Dr. Minh Ho 2017, adapted with permission

Effectiveness of HIV PrEP (TDF/FTC) Improves With Adherence



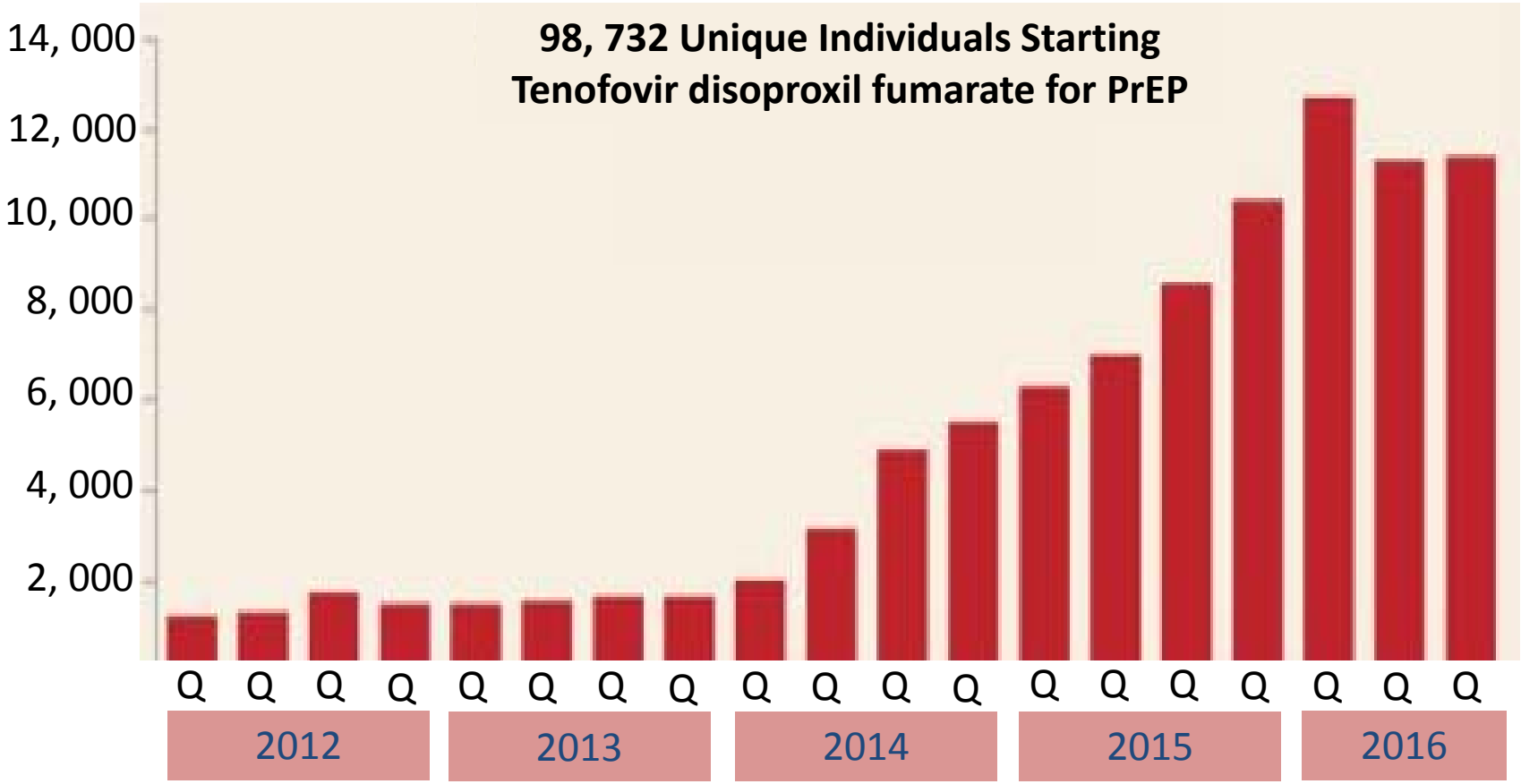
*Reduction in HIV incidence vs control. †Based on pill counts or the detection of study drug in plasma.

Slide credit: clinicaloptions.com

Is PrEP Sustainable?

- Individuals with Substance Use Disorders have been shown to be adherent to ART
- Individuals with Substance Use Disorders also have been shown to be adherent to PrEP
- PrEP = bridge over troubled water

PrEP utilization in the United States (2012-2016)



Source: http://programme.ias2017.org/Abstract/Abstract/1614

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PrEP Regimen Well Tolerated

- PrEP is well tolerated
- Safe in Pregnancy
- Discontinuations due to adverse effects are rare
- Adverse effects include abdominal pain (4%), loose stools (9%), fatigue (9%)
- Initial studies noted subclinical declines in renal function & bone marrow density

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PrEP Continuation

- Continue PrEP until life situation changes (i.e., less risk), patient no longer willing to continue, or unable to keep up with screening regimens
- HIV acquisition possible but rare with good adherence.

To PrEP or Not to PrEP?

CDC HIV PrEP Guidelines

BOX A1: RISK BEHAVIOR ASSESSMENT FOR MSM[56]

In the past 6 months:

- Have you had sex with men, women, or both?
- *(if men or both sexes)* How many men have you had sex with?
- How many times did you have receptive anal sex (you were the bottom) with a man who was not wearing a condom?
- How many of your male sex partners were HIV-positive?
- *(if any positive)* With these HIV-positive male partners, how many times did you have insertive anal sex (you were the top) without you wearing a condom?
- Have you used methamphetamines (such as crystal or speed)?

Source: Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guidelines, Available at: https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf

CDC HIV PrEP Guidelines

Box B1: Recommended Indications for PrEP Use by MSM[2]

- Adult man
- Without acute or established HIV infection
- Any male sex partners in past 6 months (if also has sex with women, see Box B2)
- Not in a monogamous partnership with a recently tested, HIV-negative man

AND at least one of the following

- Any anal sex without condoms (receptive or insertive) in past 6 months
- Any STI diagnosed or reported in past 6 months
- Is in an ongoing sexual relationship with an HIV-positive male partner

Source: Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guidelines, Available at: https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf

CDC HIV PrEP Guidelines

Box A2: Risk Behavior Assessment for Heterosexual Men and Women

In the past 6 months:

- Have you had sex with men, women, or both?
- *(if opposite sex or both sexes)* How many men/women have you had sex with?
- How many times did you have vaginal or anal sex when neither you nor your partner wore a condom?
- How many of your sex partners were HIV-positive?
- *(if any positive)* With these HIV-positive partners, how many times did you have vaginal or anal sex without a condom?

Source: Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guidelines, Available at: https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf

Box B2: Recommended Indications for PrEP Use by Heterosexually Active Men and Women

- Adult person
- Without acute or established HIV infection
- Any sex with opposite sex partners in past 6 months
- Not in a monogamous partnership with a recently tested HIV-negative partner

AND at least one of the following

- Is a man who has sex with both women and men (behaviorally bisexual) [also evaluate indications for PrEP use by Box B1 criteria]
- Infrequently uses condoms during sex with 1 or more partners of unknown HIV status who are known to be at substantial risk of HIV infection (IDU or bisexual male partner)
- Is in an ongoing sexual relationship with an HIV-positive partner

Source: Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guidelines, Available at: https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf

Box A3: Risk Behavior Assessment for Injection Drug Users

- Have you ever injected drugs that were not prescribed to you by a clinician?
- *(if yes),* When did you last inject unprescribed drugs?
- In the past 6 months, have you injected by using needles, syringes, or other drug preparation equipment that had already been used by another person?
- In the past 6 months, have you been in a methadone or other medication-based drug treatment program?

Box B3: Recommended Indications for PrEP Use by Injection Drug Users

- Adult person
- Without acute or established HIV infection
- Any injection of drugs not prescribed by a clinician in past 6 months

AND at least one of the following

- Any sharing of injection or drug preparation equipment in past 6 months
- Been in a methadone, buprenorphine, or suboxone treatment program in past 6 months
- Risk of sexual acquisition (also evaluate by criteria in Box B1 or B2)

Source: Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guidelines, Available at: https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf

CDC HIV PrEP Guidelines

Table 1: Summary of Guidance for PrEP Use

	Men Who Have Sex with Men	Heterosexual Women and Men	Injection Drug Users
Detecting substantial risk of acquiring HIV infection	HIV-positive sexual partner Recent bacterial STI High number of sex partners History of inconsistent or no condom use Commercial sex work	HIV-positive sexual partner Recent bacterial STI High number of sex partners History of inconsistent or no condom use Commercial sex work In high-prevalence area or network	HIV-positive injecting partner Sharing injection equipment Recent drug treatment (but currently injecting)
Clinically eligible	Documented negative HIV test result before prescribing PrEP No signs/symptoms of acute HIV infection Normal renal function; no contraindicated medications Documented hepatitis B virus infection and vaccination status		

Source: Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guidelines, Available at: https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf

CDC HIV PrEP Guidelines

Follow-up visits at least every 3 months to provide the following: HIV test, medication adherence counseling, behavioral risk reduction support, side effect assessment, STI symptom assessment At 3 months and every 6 months thereafter, assess renal function Every 6 months, test for bacterial STIs

Source: Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014 Clinical Practice Guidelines, Available at: https://www.cdc.gov/hiv/pdf/prepguidelines2014.pdf

PrEP Plan of Action Toolkit

PREPARED BY: THE HIV/AIDS SECTION – MEDICAL TEAM
BUREAU OF COMMUNICABLE DISEASES
DIVISION OF DISEASE CONTROL AND HEALTH PROTECTION
FLORIDA DEPARTMENT OF HEALTH

Pre-Exposure Prophylaxis (PrEP) Resource Materials for Health Care Providers

PrEP Plan of Action Toolkit

PREPARED BY: THE HIV/AIDS SECTION – MEDICAL TEAM
BUREAU OF COMMUNICABLE DISEASES
DIVISION OF DISEASE CONTROL AND HEALTH PROTECTION
FLORIDA DEPARTMENT OF HEALTH

Pre-Exposure Prophylaxis (PrEP) Resource Materials for Health Care Providers

Florida HEALTH

Provider Checklist for Initiating Truvada® for PrEP

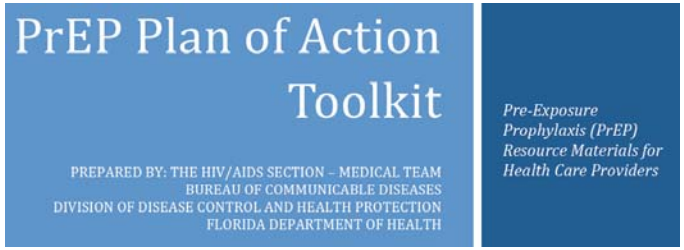
Lab Tests/Evaluation

- Completed high risk evaluation of uninfected individual.
- Confirmed a negative HIV-1 test immediately prior to initiating Truvada® for a PrEP indication
  - If clinical symptoms consistent with acute viral infection are present and recent high risk exposure is admitted within 2-3 weeks, consider delay in start of PrEP until confirming HIV-1 status or obtain an HIV viral load to rule out acute HIV infection.
- Performed HBV screening test.
- Confirmed estimated creatinine clearance (CrCl) >60 mL/min prior to initiation and periodically during treatment.
  - In patients at risk for renal dysfunction, assess estimated CrCl, serum phosphorus, urine glucose, and urine protein before initiation of Truvada® and periodically while Truvada® is being used. Assess for concomitant medications that can impair renal status. If a decrease in estimated CrCl is observed while using Truvada®, evaluate potential causes and reassess potential risks and benefits of continued use.
- Confirmed that the uninfected individual at high risk is not taking other HIV-1 medications or HBV medications.
- Evaluated risk/benefit for women who may be pregnant or may want to become pregnant.

Counseling/Follow-up

- Discussed known safety risks with use of Truvada® for a PrEP indication.
- Counseled on the importance of scheduled follow-up every 2 to 3 months, including regular HIV-1 screening tests (at least every 3 months), while taking Truvada® for a PrEP indication to reconfirm HIV-1–negative status.
- Discussed the importance of discontinuing Truvada® for a PrEP indication if seroconversion has occurred, to reduce the development of resistant HIV-1 variants.
- Counseled on the importance of adherence to daily dosing schedule.
- Counseled that Truvada® for a PrEP indication should be used only as part of a comprehensive prevention strategy.
- Educated on practicing safer sex consistently and using condoms correctly.
- Discussed the importance of the individual knowing their HIV-1 status and, if possible, that of their partner(s).
- Discussed the importance of and performed screening for sexually transmitted infections (STIs), such as syphilis and gonorrhea, which can facilitate HIV-1 transmission.
- Offered HBV vaccination as appropriate.
- Provided education on where information about Truvada® for a PrEP indication can be accessed
- If hepatitis B chronic infection is present, educate on risk of severe hepatitis flare if Truvada® is abruptly discontinued.
- Discussed potential adverse reactions.
- Reviewed the Truvada® Medication Guide with the uninfected individual at high risk.

Do the "3-STEP PrEP"



#1 Screen:

- Negative HIV Ab Test (or HIV VL if suspect acute infection)
- Check Hepatitis B, C Status
- Negative Pregnancy Screen / UDS / UA
- Creatinine Cl > 60 ml/min
- Initial STI, CBC, CMP Screen
- Consider Patient Education "Contract"

#2 Initiate:

- Truvada 90 days (no refills)
- [effective at Day 7 and Day 20]
- Follow-up Phone Call 1-2 weeks
- Return to Clinic 3 months
- Risk Reduction Counseling

#3 Maintain:

- Check triple site STI (throat, urine, rectal GC/C), serum RPR
- CBC, CMP, HIV Ab/Ag Test (every 3 months)
- Ongoing Risk Reduction Counseling
- Mental Health / Substance Use Counseling

Objective #5:
Understand HIV non-occupational Post-Exposure Prophylaxis (nPEP)

PEP 101

If you may have been exposed to HIV* in the last 72 hours, talk to your health care provider, an emergency room doctor, or your local health department about PEP right away. PEP can reduce your chance of becoming HIV-positive.

What Is PEP?

- PEP, or post-exposure prophylaxis, means taking medicines after you may have been exposed to HIV to prevent becoming infected.
- **PEP must be started within 72 hours (3 days) after you may have been exposed to HIV.** But the sooner you start PEP, the better. Every hour counts!
- If your health care provider prescribes PEP, you'll need to take it once or twice daily for 28 days.
- PEP is effective in preventing HIV, but not 100%. Always use condoms with sex partners and use safe injection practices.

Source: https://www.cdc.gov/hiv/pdf/library/factsheets/cdc-hiv-pep101.pdf, Accessed February 19, 2018

Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV—United States, 2016

from the
Centers for Disease Control and Prevention,
U.S. Department of Health and Human Services

- All persons considered for nPEP should have determination of their HIV infection status by HIV testing, preferably by using rapid combined Ag/Ab, or antibody blood tests. [VII-A1] [VII-B1]

Appropriate counseling for sexual assault, including STI and pregnancy testing if appropriate, with risk reduction is of paramount importance.

Source: CDC, US DHHS, Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV – United States, 2016.

Table 1. Estimated per-act risk for acquiring human immunodeficiency virus (HIV) from an infected source, by exposure act[a]

Exposure type	Rate for HIV acquisition per 10,000 exposures
Parenteral	
Blood transfusion	9,250
Needle sharing during injection drug use	63
Percutaneous (needlestick)	23
Sexual	
Receptive anal intercourse	138
Receptive penile-vaginal intercourse	8
Insertive anal intercourse	11
Insertive penile-vaginal intercourse	4
Receptive oral intercourse	Low
Insertive oral intercourse	Low
Other[b]	
Biting	Negligible
Spitting	Negligible
Throwing body fluids (including semen or saliva)	Negligible
Sharing sex toys	Negligible

Source: http://www.cdc.gov/hiv/policies/law/risk.html

[a] Factors that may increase the risk of HIV transmission include sexually transmitted diseases, acute and late-stage HIV infection, and high viral load. Factors that may decrease the risk include condom use, male circumcision, antiretroviral treatment, and preexposure prophylaxis. None of these factors are accounted for in the estimates presented in the table.

[b] HIV transmission through these exposure routes is technically possible but unlikely and not well documented.

Source: CDC, US DHHS, Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV – United States, 2016.

HIV nPEP

- All persons evaluated for possible nPEP should be provided any indicated prevention, treatment, or supportive care for other exposure-associated health risks and conditions (e.g., bacterial sexually transmitted infections, traumatic injuries, hepatitis B virus and hepatitis C virus infection, or pregnancy). [VII] [VII-B3] [VII-B4] [VII-B5] [VII-D]

- All persons who report behaviors or situations that place them at risk for frequently recurring HIV exposures (e.g., injection drug use, or sex without condoms) or who report receipt of ≥1 course of nPEP in the past year should be provided risk-reduction counseling and intervention services, including consideration of preexposure prophylaxis. [VII-E4] [VII-E5]

Source: CDC, US DHHS, Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV – United States, 2016.

HIV nPEP

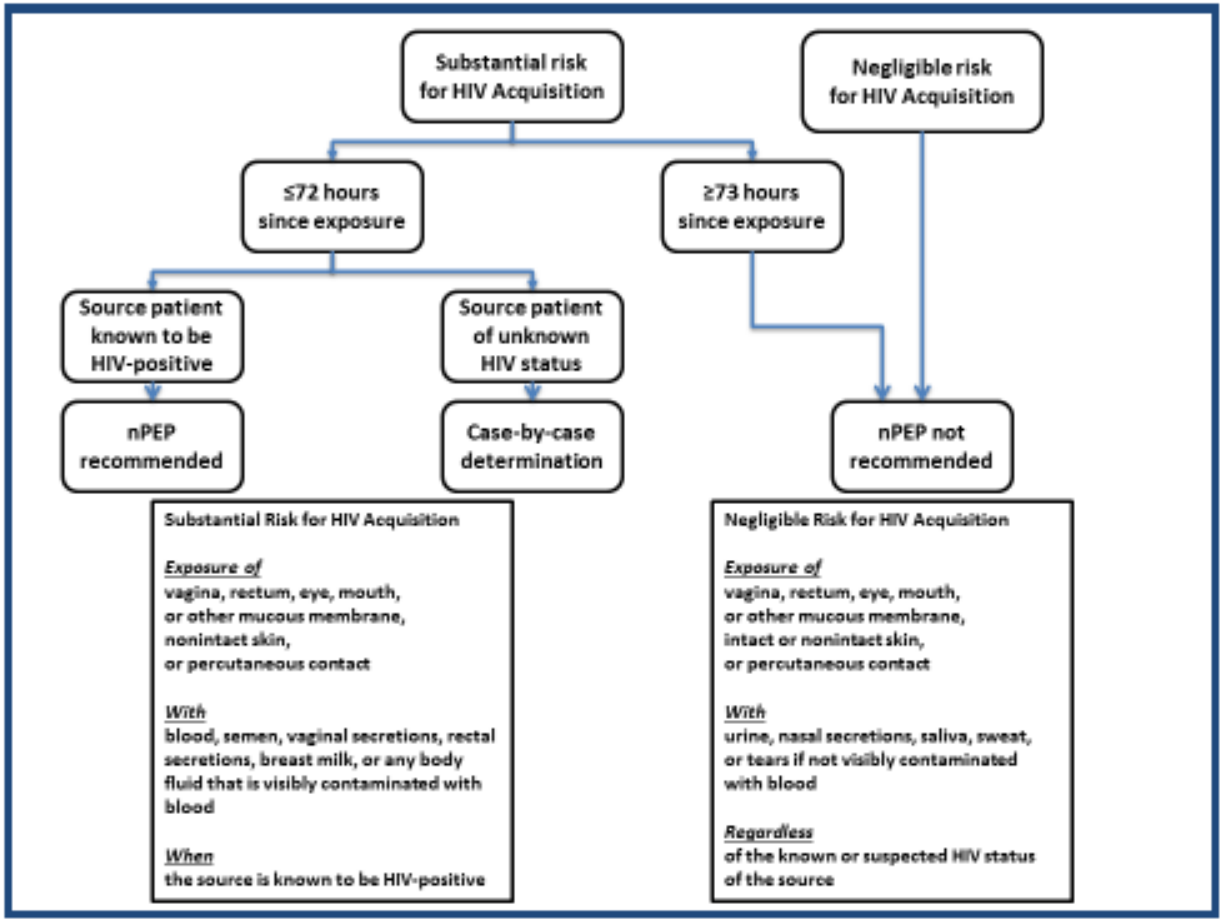
- All persons offered nPEP should be prescribed a 28-day course of a 3-drug antiretroviral regimen.[a] [VII-B1] [VII-C]
  - The preferred regimen for otherwise healthy adults and adolescents
    - tenofovir disoproxil fumarate (tenofovir DF or TDF) (300 mg) with emtricitabine (200 mg) once daily *plus*

      raltegravir (RAL) 400 mg twice daily or dolutegravir (DTG) 50 mg daily. [VI-A2ci] [VII-C]
  - Alternative regimen for otherwise healthy adults and adolescents is
    - tenofovir DF (300 mg) with emtricitabine (FTC) (200 mg) once daily *plus*

      darunavir (DRV) (800 mg) and ritonavir[a] (RTV) (100 mg) once daily. [VII-C]

Source: CDC, US DHHS, Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV – United States, 2016.

Figure 1. Algorithm for evaluation and treatment of possible nonoccupational HIV exposures



Procedures at the evaluation visit include determining the HIV infection status of the potentially exposed person and the source person (if available), the timing and characteristics of the exposure for which care is being sought, and the frequency of possible HIV exposures. Additionally, to determine whether other treatment or prophylaxis is indicated, health care providers should assess the likelihood of STIs, infections efficiently transmitted by injection practices or needlesticks (e.g., hepatitis B or hepatitis C virus), and pregnancy for women.

Source: CDC, US DHHS, Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV – United States, 2016.

Table 2. Recommended schedule of laboratory evaluations of source and exposed persons for providing nPEP with preferred regimens

Test	Source	Exposed persons			
	Baseline	Baseline	4–6 weeks after exposure	3 months after exposure	6 months after exposure
	For all persons considered for or prescribed nPEP for any exposure				
HIV Ag/Ab testing[a] (or antibody testing if Ag/Ab test unavailable)	✓	✓	✓	✓	✓[b]
Hepatitis B serology, including: hepatitis B surface antigen, hepatitis B surface antibody, hepatitis B core antibody	✓	✓	—	—	✓[c]
Hepatitis C antibody test	✓	✓	—	—	✓[d]
	For all persons considered for or prescribed nPEP for sexual exposure				
Syphilis serology[e]	✓	✓	✓	—	✓
Gonorrhea[f]	✓	✓	✓[g]	—	—
Chlamydia[f]	✓	✓	✓[g]	—	—
Pregnancy[h]	—	✓	✓	—	—
	For persons prescribed tenofovir DF+ emtricitabine + raltegravir or tenofovir DF+ emtricitabine + dolutegravir				
Serum creatinine (for calculating estimated creatinine clearance[i])		✓	✓	—	—
Alanine transaminase, aspartate aminotranferase		✓	✓	—	—
	For all persons with HIV infection confirmed at any visit				
HIV viral load	✓	✓[j]			
HIV genotypic resistance	✓	✓[j]			

Source: CDC, US DHHS, Updated Guidelines for Antiretroviral Postexposure Prophylaxis After Sexual, Injection Drug Use, or Other Nonoccupational Exposure to HIV – United States, 2016.

Objective #6 & 7:
HIV Occupational Post-Exposure Prophylaxis (oPEP)

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY SEPTEMBER 2013, VOL. 34, NO. 9

US PUBLIC HEALTH SERVICE GUIDELINE

Updated US Public Health Service Guidelines for the Management of Occupational Exposures to Human Immunodeficiency Virus and Recommendations for Postexposure Prophylaxis

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for the US Public Health Service Working Group

Box 2: Follow-Up of Healthcare Personnel (HCP) Exposed to Known or Suspected Human Immunodeficiency Virus (HIV)–Positive Sources

Counseling (at the time of exposure and at follow-up appointments). Exposed HCP should be advised to use precautions (eg, use of barrier contraception and avoidance of blood or tissue donations, pregnancy, and, if possible, breast-feeding) to prevent secondary transmission, especially during the first 6–12 weeks after exposure.

For exposures for which postexposure prophylaxis (PEP) is prescribed, HCP should be informed regarding the following:

- Possible drug toxicities (eg, rash and hypersensitivity reactions that could imitate acute HIV seroconversion and the need for monitoring)
- Possible drug interactions
- The need for adherence to PEP regimens

Early reevaluation after exposure. Regardless of whether a healthcare provider is taking PEP, reevaluation of exposed HCP within 72 hours after exposure is strongly recommended, as additional information about the exposure or source person may be available.

Follow-up testing and appointments. Follow-up testing at a minimum should include the following:

- HIV testing at baseline and at 6 weeks, 12 weeks, and 6 months after exposure; alternatively, if the clinician is certain that a fourth-generation combination HIV p24 antigen–HIV antibody test is being utilized, then HIV testing could be performed at baseline, 6 weeks after exposure, and 4 months after exposure
- Complete blood counts and renal and hepatic function tests (at baseline and 2 weeks after exposure; further testing may be indicated if abnormalities are detected)

HIV testing results should preferably be given to the exposed healthcare provider at face-to-face appointments.

Box 1: Situations for Which Expert Consultation for Human Immunodeficiency Virus (HIV) Postexposure Prophylaxis (PEP) Is Recommended

Delayed (ie, later than 72 hours) exposure report
- Interval after which benefits from PEP are undefined

Unknown source (eg, needle in sharps disposal container or laundry)
- Use of PEP to be decided on a case-by-case basis
- Consider severity of exposure and epidemiologic likelihood of HIV exposure
- Do not test needles or other sharp instruments for HIV

Known or suspected pregnancy in the exposed person
- Provision of PEP should not be delayed while awaiting expert consultation

Breast-feeding in the exposed person
- Provision of PEP should not be delayed while awaiting expert consultation

Known or suspected resistance of the source virus to antiretroviral agents
- If source person's virus is known or suspected to be resistant to 1 or more of the drugs considered for PEP, selection of drugs to which the source person's virus is unlikely to be resistant is recommended
- Do not delay initiation of PEP while awaiting any results of resistance testing of the source person's virus

Toxicity of the initial PEP regimen
- Symptoms (eg, gastrointestinal symptoms and others) are often manageable without changing PEP regimen by prescribing antimotility or antiemetic agents
- Counseling and support for management of side effects is very important, as symptoms are often exacerbated by anxiety

Serious medical illness in the exposed person
- Significant underlying illness (eg, renal disease) or an exposed provider already taking multiple medications may increase the risk of drug toxicity and drug-drug interactions

Expert consultation can be made with local experts or by calling the National Clinicians' Post-Exposure Prophylaxis Hotline (PEPline) at 888-448-4911.

Occupational Post-exposure Prophylaxis (PEP) Protocol

- Baseline Hepatitis B, C, HIV Ab/Ag serologies of exposed person
- Ideally baseline Hepatitis B, C, HIV Ab/Ag serologies of index person
- Employees should know current Hepatitis A/B/C status in advance
- Offer vaccination for Hep A&B if not already; need HepBsAb > 10 IU/ml

TABLE A1. Human Immunodeficiency Virus (HIV) Postexposure Prophylaxis (PEP) Regimens

Preferred HIV PEP Regimen

Raltegravir (Isentress; RAL) 400 mg PO twice daily

Plus

Truvada, 1 PO once daily

(Tenofovir DF [Viread; TDF] 300 mg + emtricitabine [Emtriva; FTC] 200 mg)

Alternative Regimens

(May combine 1 drug or drug pair from the left column with 1 pair of nucleoside/nucleotide reverse-transcriptase inhibitors from the right column; prescribers unfamiliar with these agents/regimens should consult physicians familiar with the agents and their toxicities)[a,b]

Raltegravir (Isentress; RAL)	Tenofovir DF (Viread; TDF) + emtricitabine (Emtriva; FTC); available as Truvada
Darunavir (Prezista; DRV) + ritonavir (Norvir; RTV)	Tenofovir DF (Viread; TDF) + lamivudine (Epivir; 3TC)
Etravirine (Intelence; ETR)	Zidovudine (Retrovir; ZDV; AZT) + lamivudine (Epivir; 3TC); available as Combivir
Rilpivirine (Edurant; RPV)	Zidovudine (Retrovir; ZDV; AZT) + emtricitabine (Emtriva; FTC)
Atazanavir (Reyataz; ATV) + ritonavir (Norvir; RTV)	
Lopinavir/ritonavir (Kaletra; LPV/RTV)	

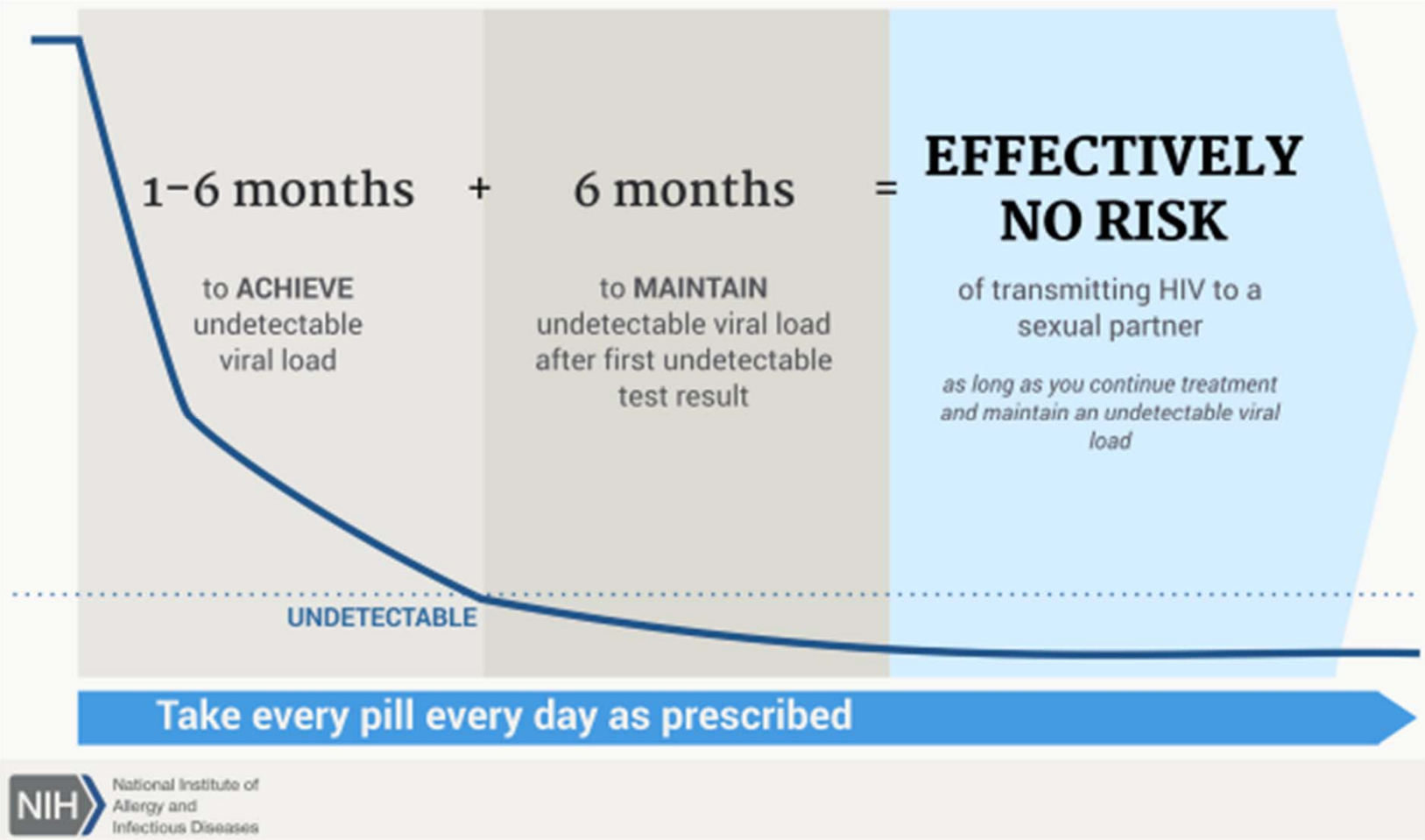
The following alternative is a complete fixed-dose combination regimen, and no additional antiretrovirals are needed: Stribild (elvitegravir, cobicistat, tenofovir DF, emtricitabine)

Conclusions

There are
MANY WAYS
to
PREVENT
HIV
TEST
UNDETECTABLE
CONDOMS
PrEP
Do it your way at doitlondon.org
LONDON
DO IT
TEST·PROTECT·PREVENT HIV

TREATMENT IS PREVENTION

A scientific breakthrough in 2011 showed that HIV treatment not only saves lives, but reduces the risk by **96%** of transmitting the disease.



Note: “undetectable HIV VL” <= 200 copies/ml, ideally < 20 copies/ml

Source: https://www.niaid.nih.gov/news-events/10-things-know-about-hiv-suppression

UNDETECTABLE = UNTRANSMITTABLE

Undeniable. Unifying.

We must embrace U=U to eliminate the stigma associated with treating people living with HIV as 'vectors of disease.' Promoting the U=U message in clinical and community settings will also generate treatment demand and contribute to achieving HIV epidemic control.

— José M. Zuniga, PhD, MPH
IAPAC President/CEO

IAPAC
INTERNATIONAL ASSOCIATION OF PROVIDERS OF AIDS CARE

www.IAPAC.org

Objectives

1) Current HIV Epidemiology
2) Current HIV Screening Guidelines
3) Current HIV Testing & Reliability
4) HIV Pre-Exposure Prophylaxis (PrEP)
5) HIV non-occupational PEP (nPEP)
6) Occupational Post-Exposure Prophylaxis (oPEP)
7) HIV Occupational Exposure Guidelines

Together We Can End HIV

Human Immunodeficiency Virus (HIV) Risk Assessment: Pre/Post Exposure Prophylaxis & Current HIV Testing

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February 20, 2018

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QUESTIONS?

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