HIV UPDATES: WHERE ARE WE IN 2018?

Carolyn Chu, MD, MSc, AAHIVS, FAAFP

Clinician Consultation Center, UCSF

California Providers' Best Practices Conference-
May 2018

TODAY'S TOPICS

- Epidemiology updates
- HIV prevention
- Testing
- Antiretroviral therapy options and treatment strategies
- Primary care and HIV
- HIV and substance use

What Does the Generalist Need to Know About HIV Infection?

Joel E. Gallant

Despite recent improvements in the efficacy, safety, tolerability, and convenience of antiretroviral therapy for patients, the management of HIV infection remains complex for clinicians. Multiple studies have shown better clinical outcomes and lower cost of care when HIV-infected patients are managed by experts. However, generalists are frequently involved in the care of patients with HIV infection, in many cases providing primary care in collaboration with an HIV expert. Generalists also play a critical role in the diagnosis and prevention of HIV infection. Generalists managing HIV-infected patients should be aware of the components of the initial patient evaluation. They should be familiar with the general principles of antiretroviral therapy and opportunistic infection prevention. They should be able to recognize antiretroviral toxicity and should be aware of common drug-drug interactions involving antiretroviral agents.

Key Words: HIV, Antiretroviral therapy, Primary care, Expertise

There is broad consensus that HIV-infected patients should be managed under the direction of an HIV expert. Expert care is associated with reduced morbidity, mortality, and cost of care,[1-6] reflecting the complexity of HIV infection and its treatment. However, the model of care that was popular in the early years of the acquired immune deficiency syndrome (AIDS) epidemic, in which experts provided comprehensive primary and specialty care to HIV-infected patients, may no longer be viable in all settings. Although the number of HIV-infected patients increases, the number of HIV experts appears to be shrinking. As a result of the effectiveness of antiretroviral therapy (ART) and the aging of the HIV-infected population, HIV disease is often low on the list of medical priorities for many patients. Some HIV experts, many of whom are trained in infectious diseases, may be neither inclined nor qualified to provide primary care for an aging population. As more infected patients become "mainstreamed" into general medical practices, generalists will need to have a basic understanding of the management of HIV-positive patients.

The generalist who provides primary care problems, the patient may be seen regularly by the generalist, the expert, and possibly other subspecialists, with care coordinated by the generalist. HIV-infected patients who live in small towns or rural communities may not have easy access to an HIV expert. However, care can still be guided by an expert with infrequent visits (in person or by telemedicine) and regular communication between the generalist and the expert by e-mail, telephone, or fax.

I have used the term "expert" rather than "specialist" in this discussion in part because there are currently no specialty boards for HIV medicine nor is there any required form of training. Many experts are infectious

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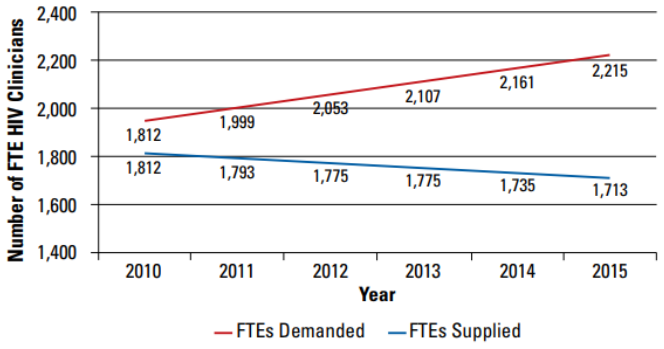
Figure 1. Forecasted Supply and Demand of FTE HIV Clinicians, 2010–2015



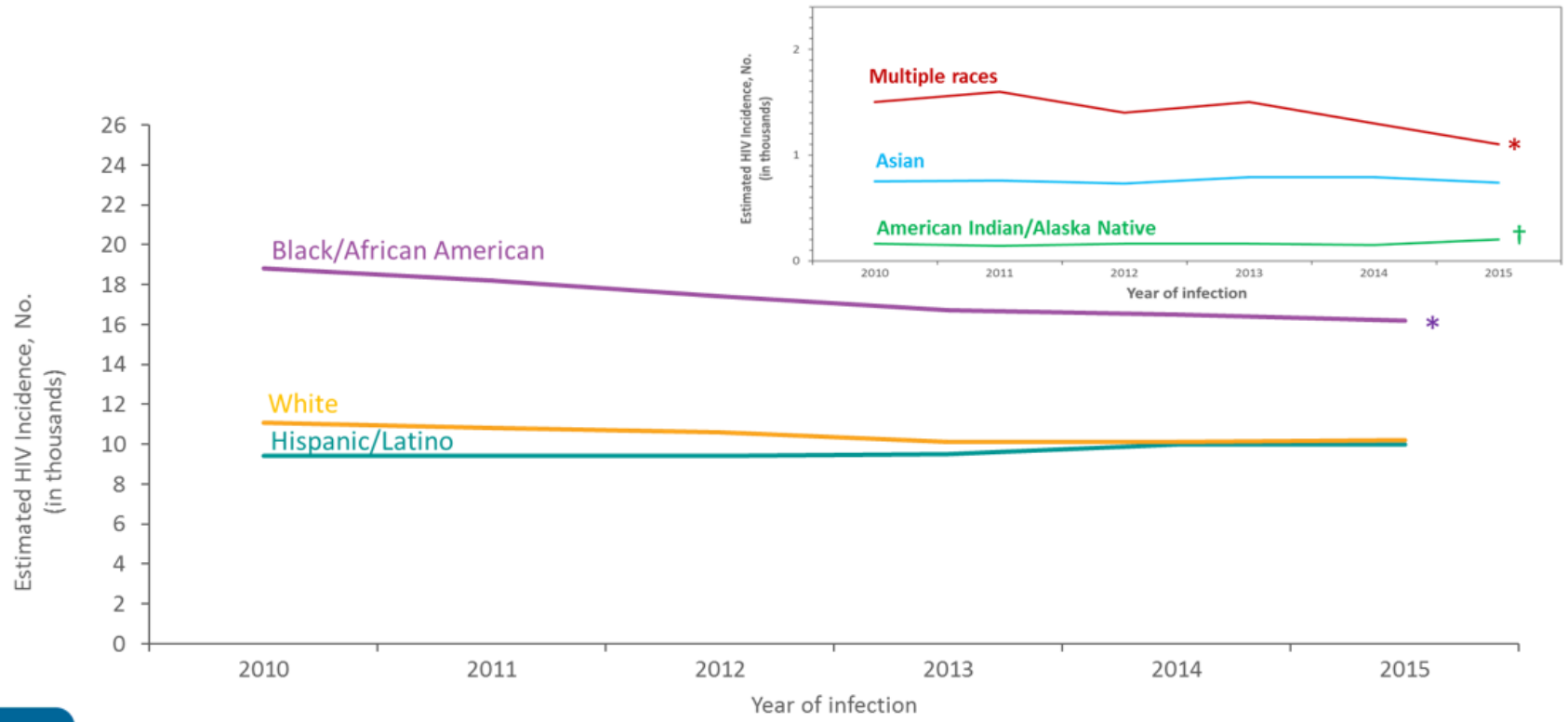
FTE = full-time equivalent.

Sources: HIV Clinician Workforce Survey 2012, NAMCS (2009), NHAMCS (2008), HCUP-NIS (2002–2009), and federal and state HIV surveillance data (2008).

"ON A SCALE OF 1-5, THIS IS HOW I <u>REALLY</u> FEEL ABOUT LEARNING THE HIV MEDICATIONS..."

1 2 3 4 5

Estimated HIV Incidence among Persons Aged ≥13 Years, by Race/Ethnicity, 2010–2015—United States



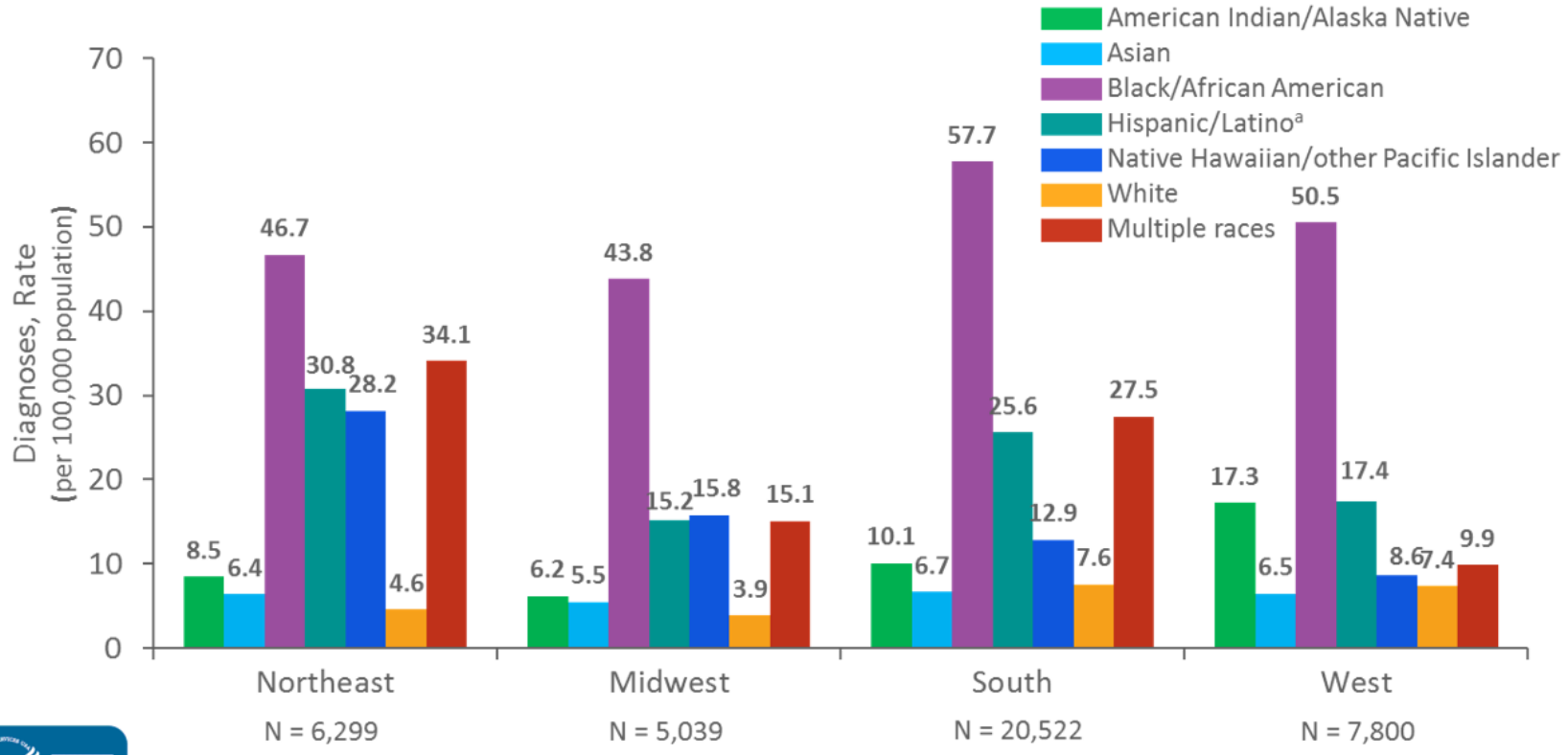
Note. Estimates were derived from a CD4 depletion model using HIV surveillance data. Hispanics/Latinos can be of any race.
* Difference from the 2010 estimate was deemed statistically significant ($P < .05$).
† Estimates should be used with caution because they do not meet the standard of reliability.

Adults and Adolescents Living with Diagnosed HIV Infection by Race/Ethnicity Year-end 2015—United States

Race/Ethnicity	No.	Rate	%
American Indian/Alaska Native	2,904	122.6	0.3
Asian[a]	12,887	74.8	1.3
Black/African American	405,857	1,017.8	41.7
Hispanic/Latino[b]	213,736	379.4	21.9
Native Hawaiian/other Pacific Islander	891	160.3	0.1
White	298,670	150.9	30.7
Multiple races	37,934	577.3	3.9
Total[c]	**973,846**	**303.5**	**100**

Note. Rates are per 100,000 population.
[a] Includes Asian/Pacific Islander legacy cases.
[b] Hispanics/Latinos can be of any race.
[c] Includes 967 persons whose race/ethnicity is unknown.

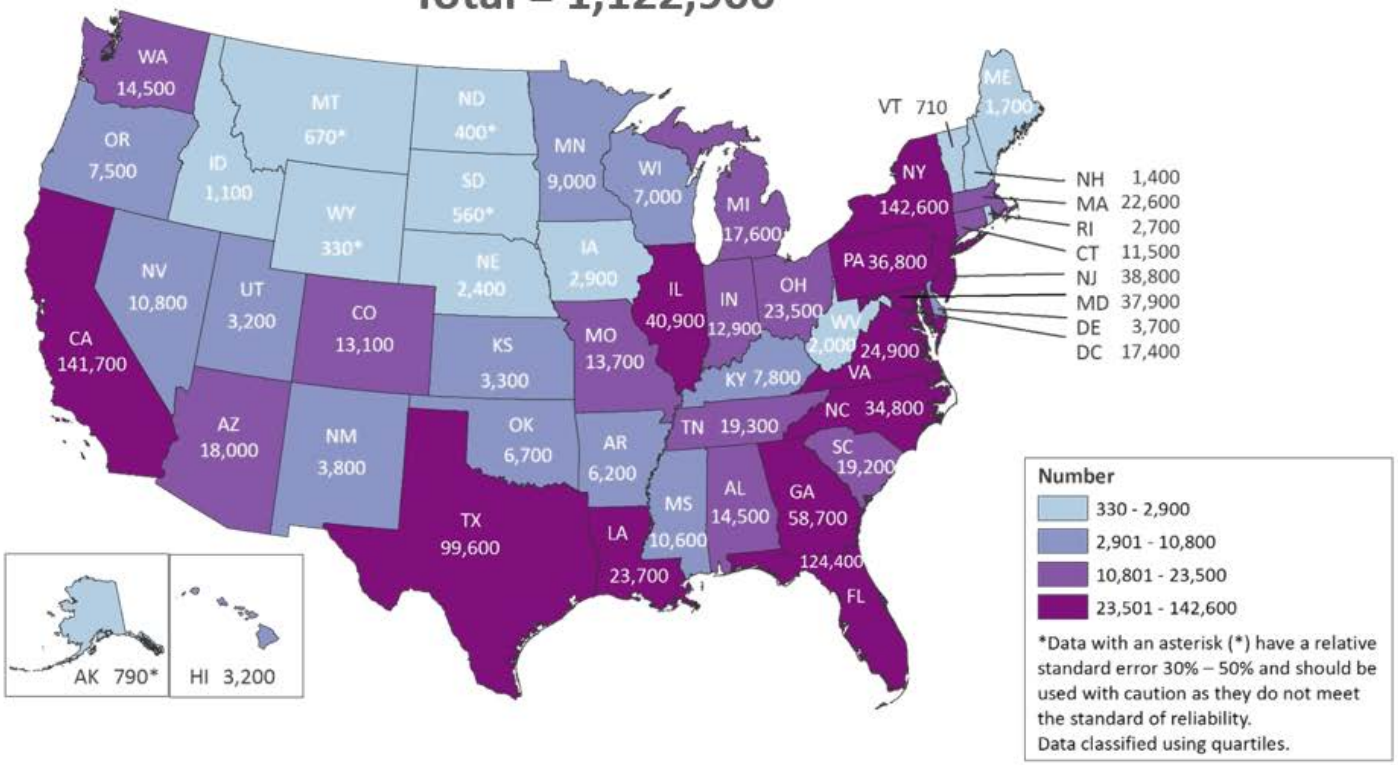
Diagnoses of HIV Infection among Adults and Adolescents by Region and Race/Ethnicity, 2016—United States



Note. Data for the year 2016 are preliminary and based on 6 months reporting delay.
[a] Hispanics/Latinos can be of any race.

Estimated HIV Prevalence among Persons Aged ≥13 years, by Area of Residence, 2015—United States

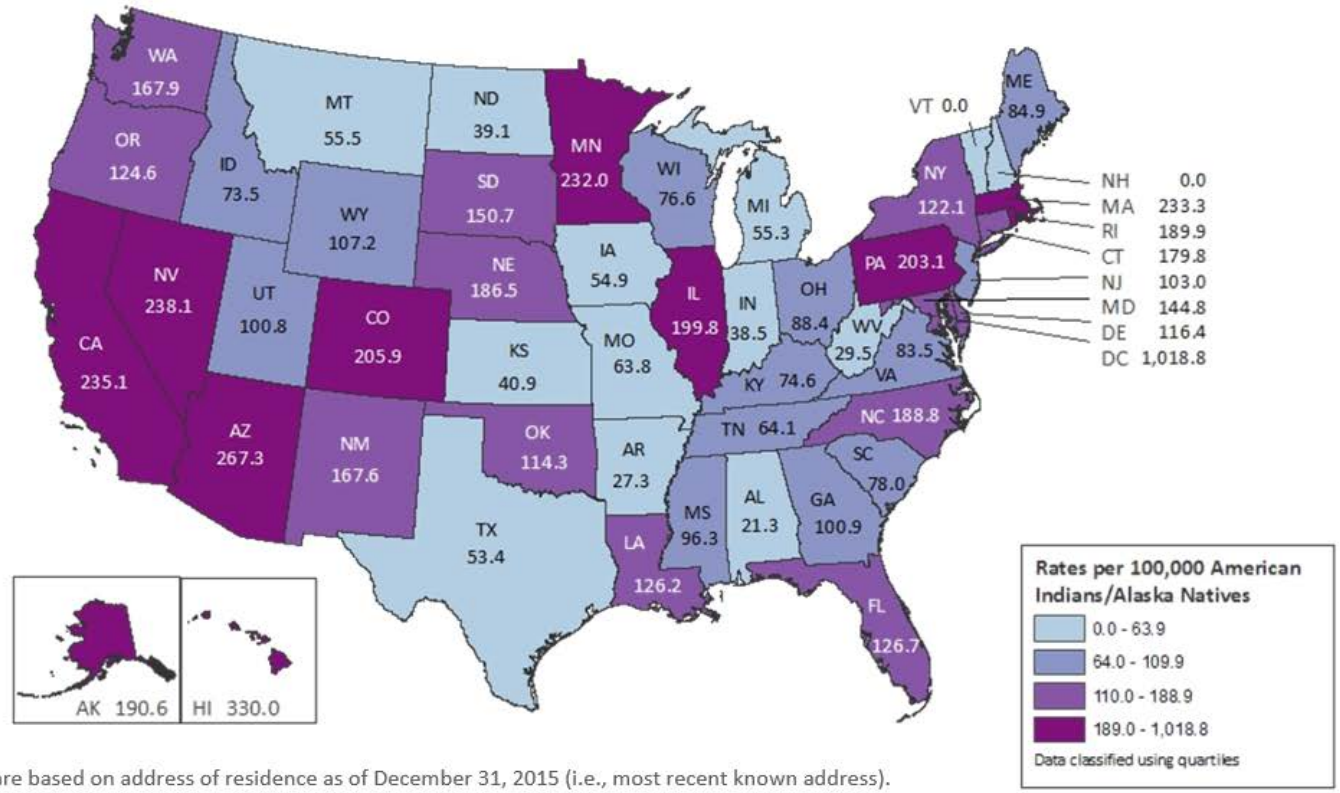
Total = 1,122,900



Note. Estimates were derived from a CD4 depletion model using HIV surveillance data. Estimates rounded to the nearest 100 for estimates >1,000 and to the nearest 10 for estimates ≤1,000 to reflect model uncertainty.

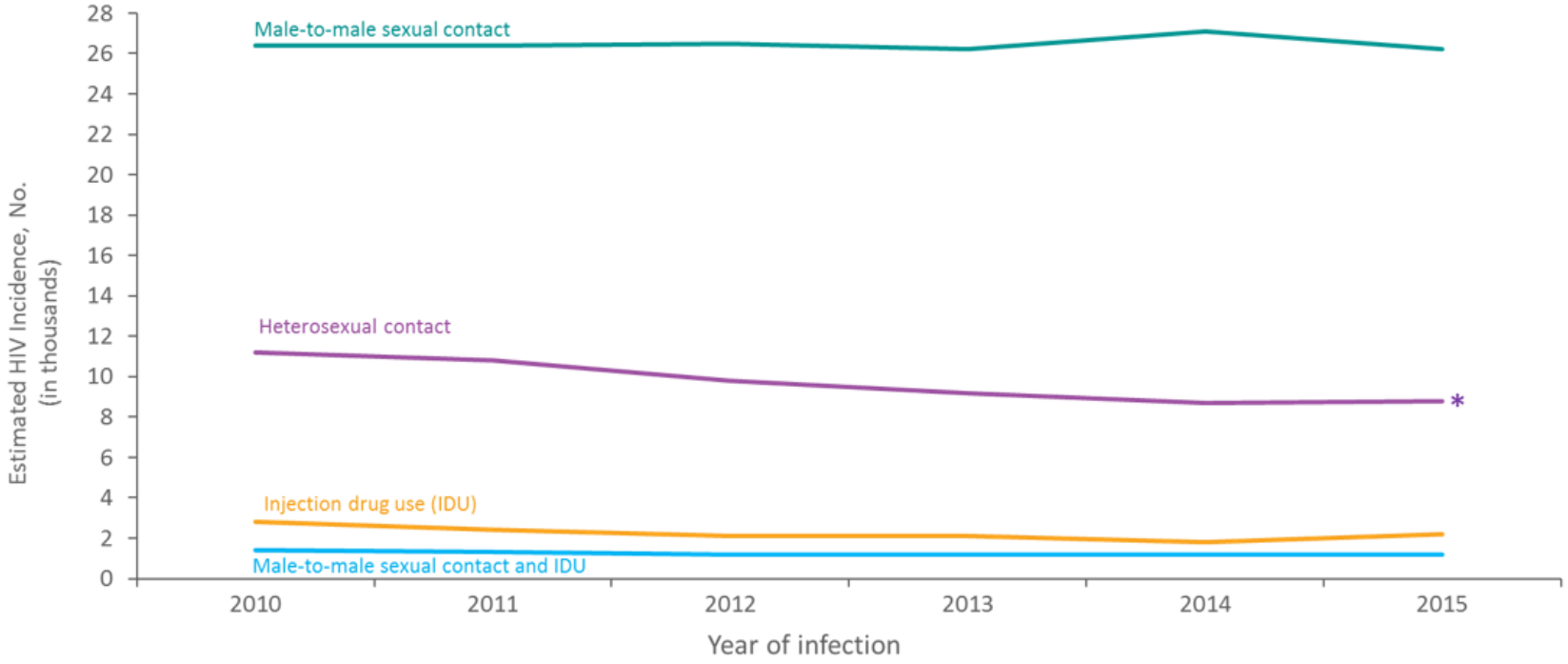
Rates of American Indian/Alaska Native Adults and Adolescents Living with Diagnosed HIV Infection, by Area of Residence, Year-end 2015 — United States

N = 2,896 **Total Rate: 150.8**



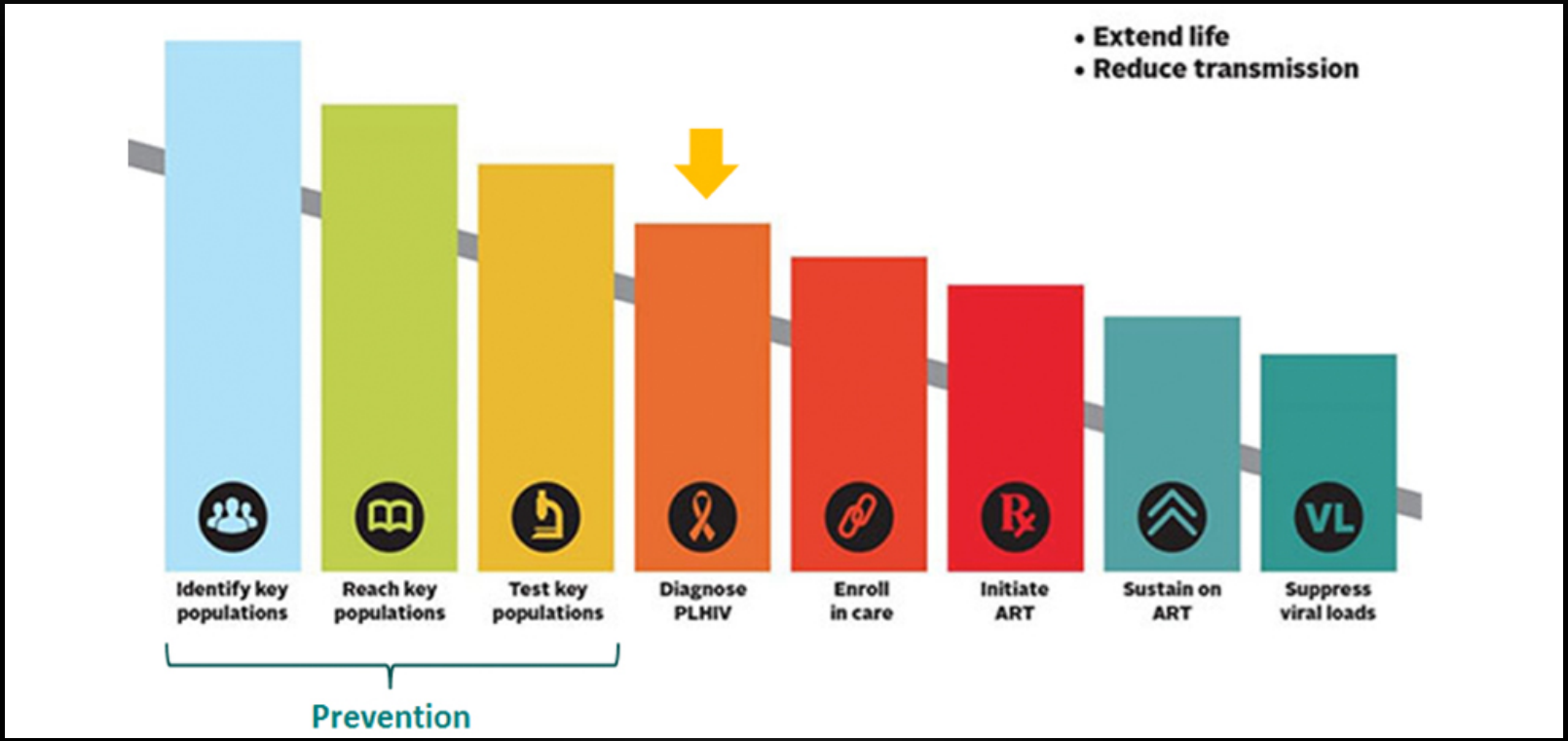
Note: Data are based on address of residence as of December 31, 2015 (i.e., most recent known address).

Estimated HIV Incidence among Persons Aged ≥13 Years, by Transmission Category, 2010–2015—United States

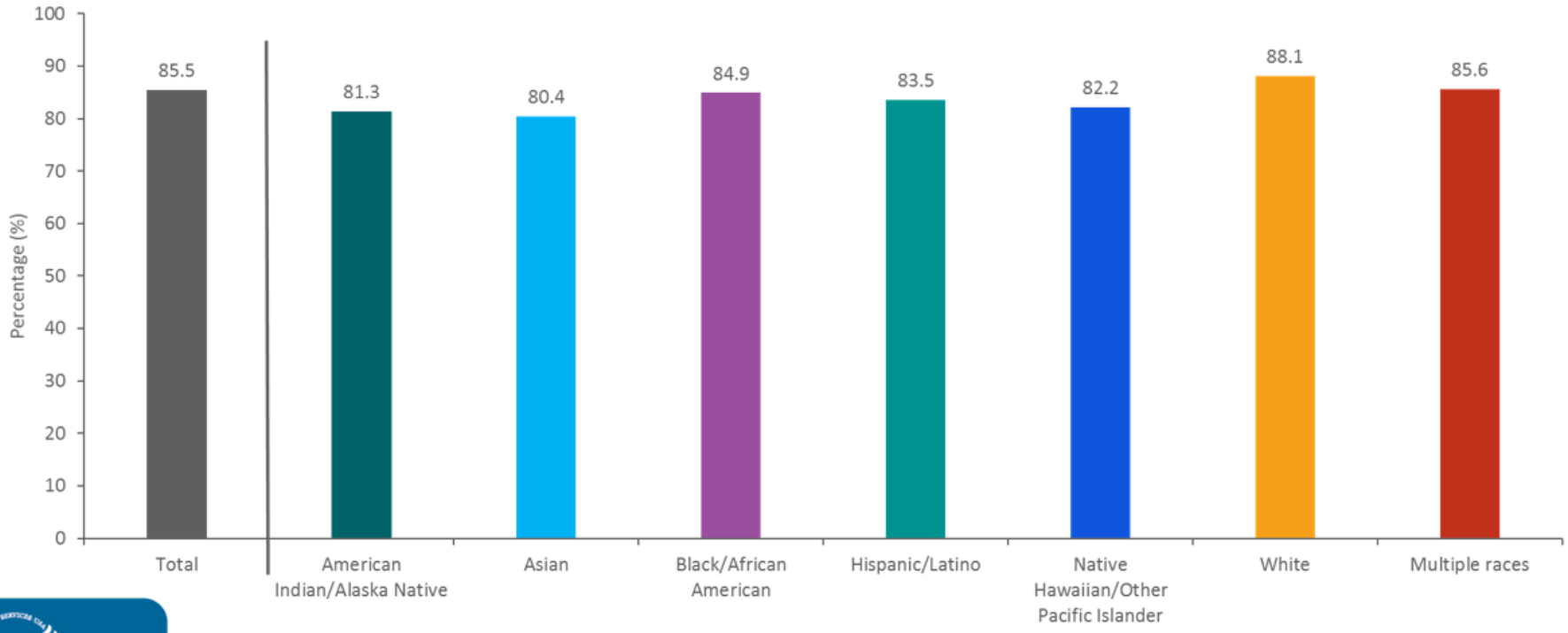


Note. Estimates were derived from a CD4 depletion model using HIV surveillance data. Data have been statistically adjusted to account for missing transmission category. Heterosexual contact is with a person known to have, or to be at high risk for, HIV infection.
* Difference from the 2010 estimate was deemed statistically significant ($P < .05$).

HIV CARE CASCADE

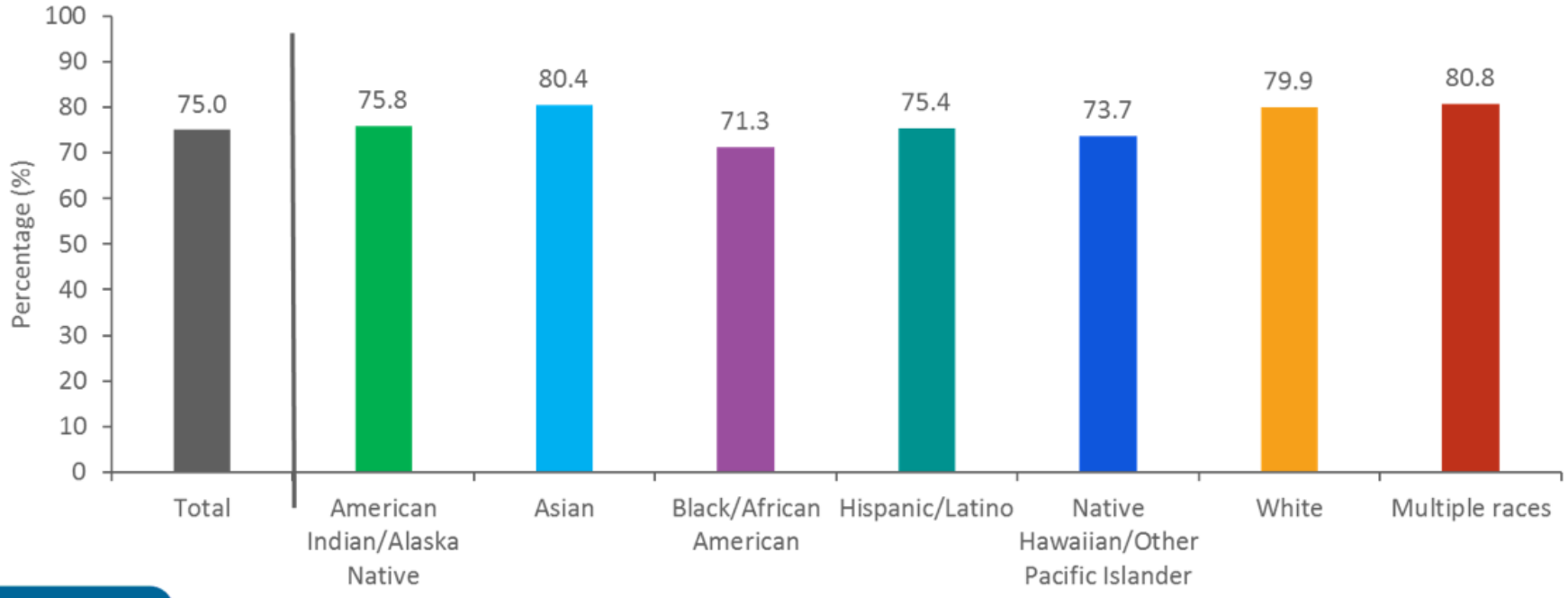


Diagnosed Infection among Persons Aged ≥13 Years Living with Diagnosed or Undiagnosed HIV Infection, by Race/Ethnicity, 2015—United States



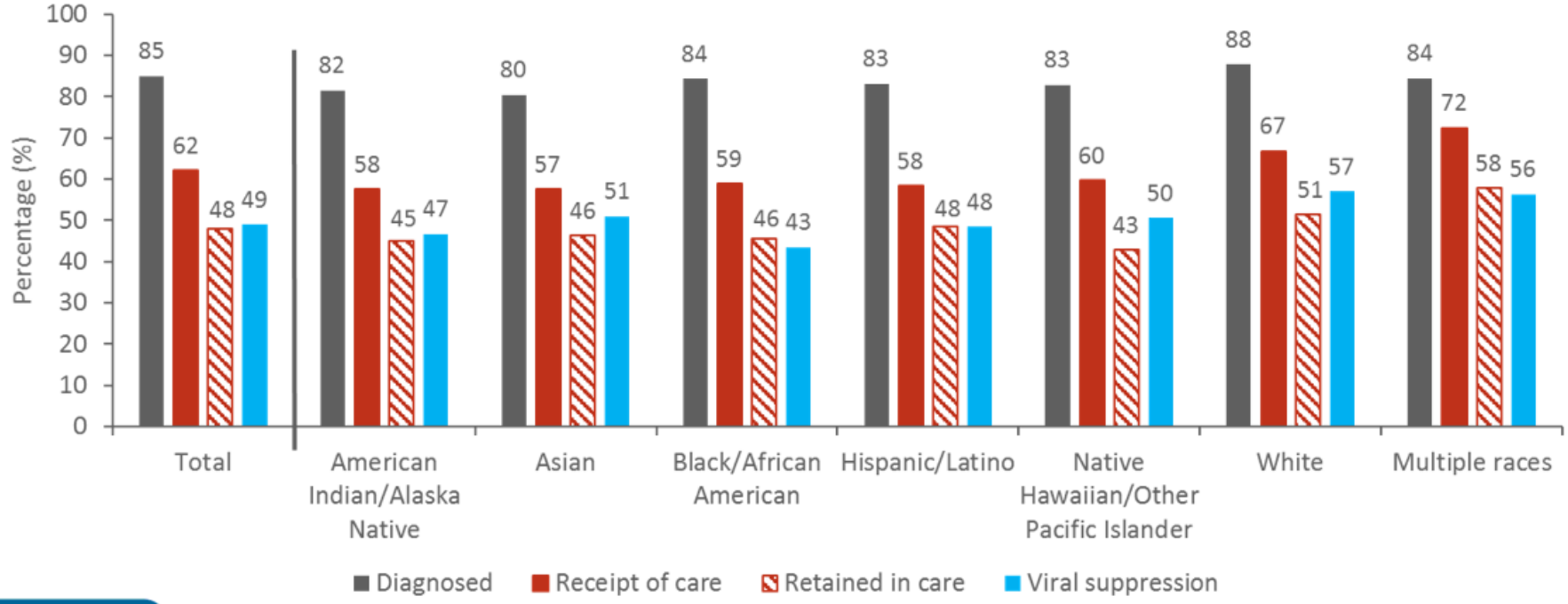
Note. Estimates were derived from a CD4 depletion model using HIV surveillance data. Asian includes Asian/Pacific Islander legacy cases. Hispanics/Latinos can be of any race.

Linkage to HIV Medical Care within 1 Month after HIV Diagnosis during 2015, among Persons Aged ≥13 Years, by Race/Ethnicity—37 States and the District of Columbia



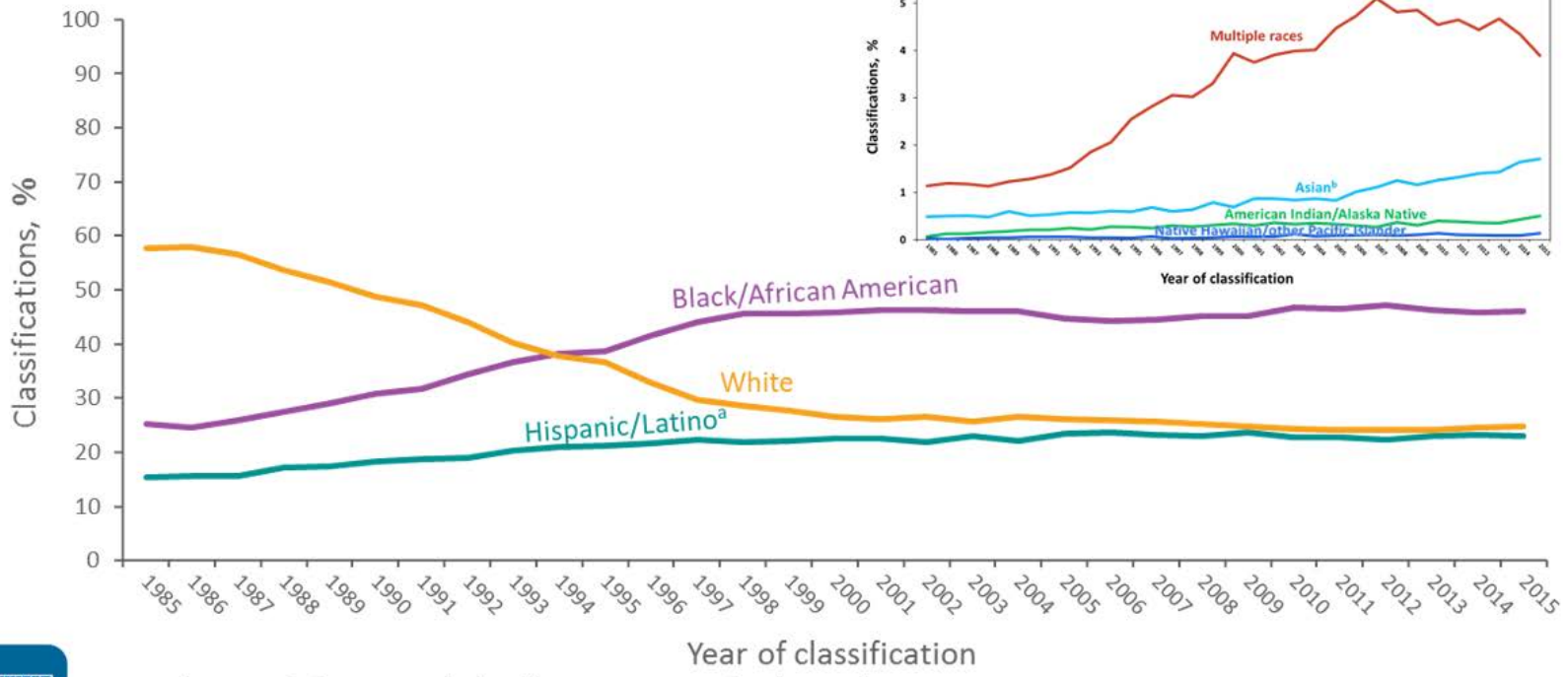
Note. Linkage to HIV medical care was defined as having a CD4 or VL test ≤1 month after HIV diagnosis. Hispanics/Latinos can be of any race.

Persons Living with Diagnosed or Undiagnosed HIV Infection
HIV Care Continuum Outcomes, by Race/Ethnicity, 2014—United States



Note. Receipt of medical care was defined as ≥1 test (CD4 or VL) in 2014. Retained in continuous medical care was defined as ≥2 tests (CD4 or VL) ≥3 months apart in 2014. Viral suppression was defined as <200 copies/mL on the most recent VL test in 2014. Asian includes Asian/Pacific Islander legacy cases. Hispanics/Latinos can be of any race.

Percentages of Stage 3 (AIDS) Classifications among Adults and Adolescents with Diagnosed HIV Infection, by Race/Ethnicity and Year of Classification, 1985–2015—United States and 6 Dependent Areas



Note. Unknown race/ethnicity is not displayed because it comprises less than 1% of cases.
[a] Hispanics/Latinos can be of any race.
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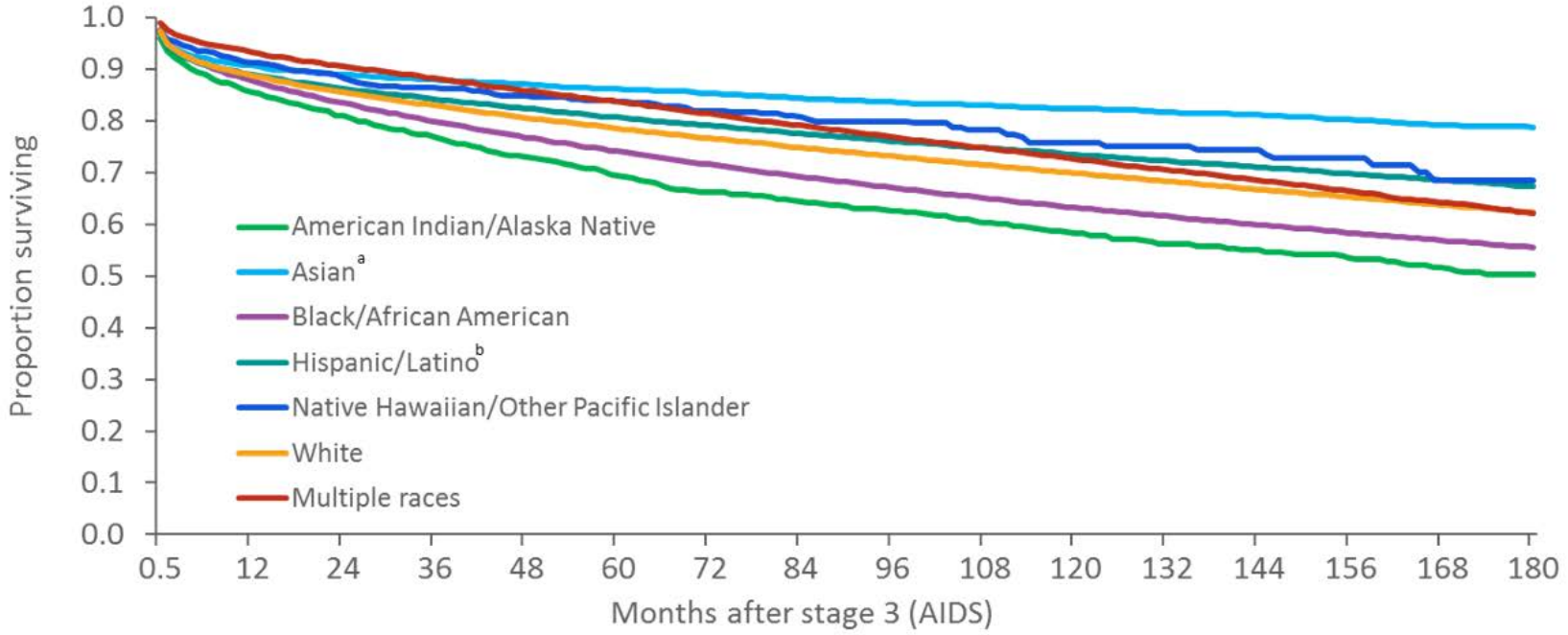
Survival after Classification of Stage 3 (AIDS) during 1999-2012, by Months Survived and Race/Ethnicity—United States and 6 Dependent Areas



Note. Data exclude persons whose month of diagnosis or month of death is unknown.
[a] Includes Asian/Pacific Islander legacy cases.
[b] Hispanics/Latinos can be of any race.

Adults and Adolescents Living with Diagnosed HIV Infection Ever Classified as Stage 3 (AIDS), by Race/Ethnicity, Year-end 2015—United States

Race/Ethnicity	No.	Rate	%
American Indian/Alaska Native	1,492	63.0	0.3
Asian[a]	6,211	36.1	1.2
Black/African American	215,024	539.2	41.2
Hispanic/Latino[b]	120,770	214.4	23.1
Native Hawaiian/other Pacific Islander	452	81.3	0.1
White	155,958	78.8	29.9
Multiple races	22,331	339.9	4.3
Total[c]	**522,283**	**162.8**	**100**

Note. Rates are per 100,000 population.
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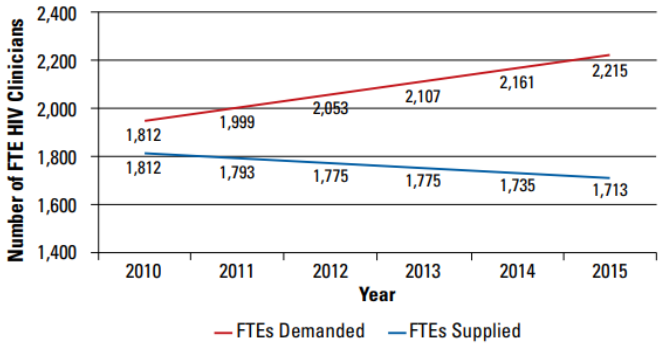

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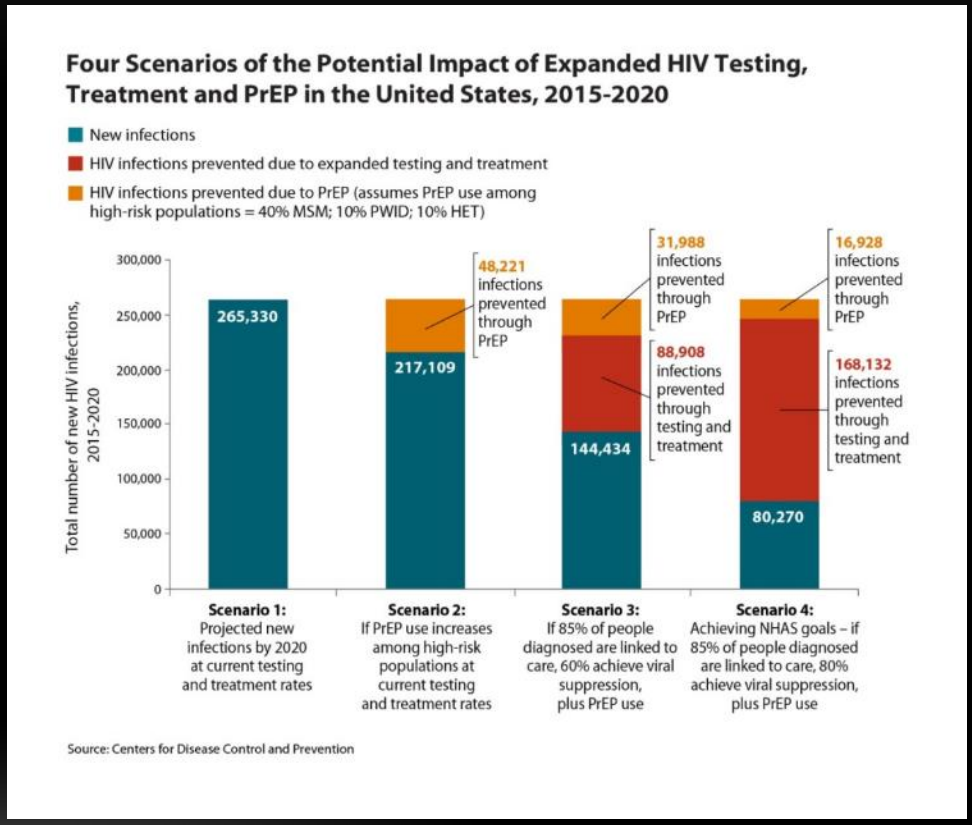
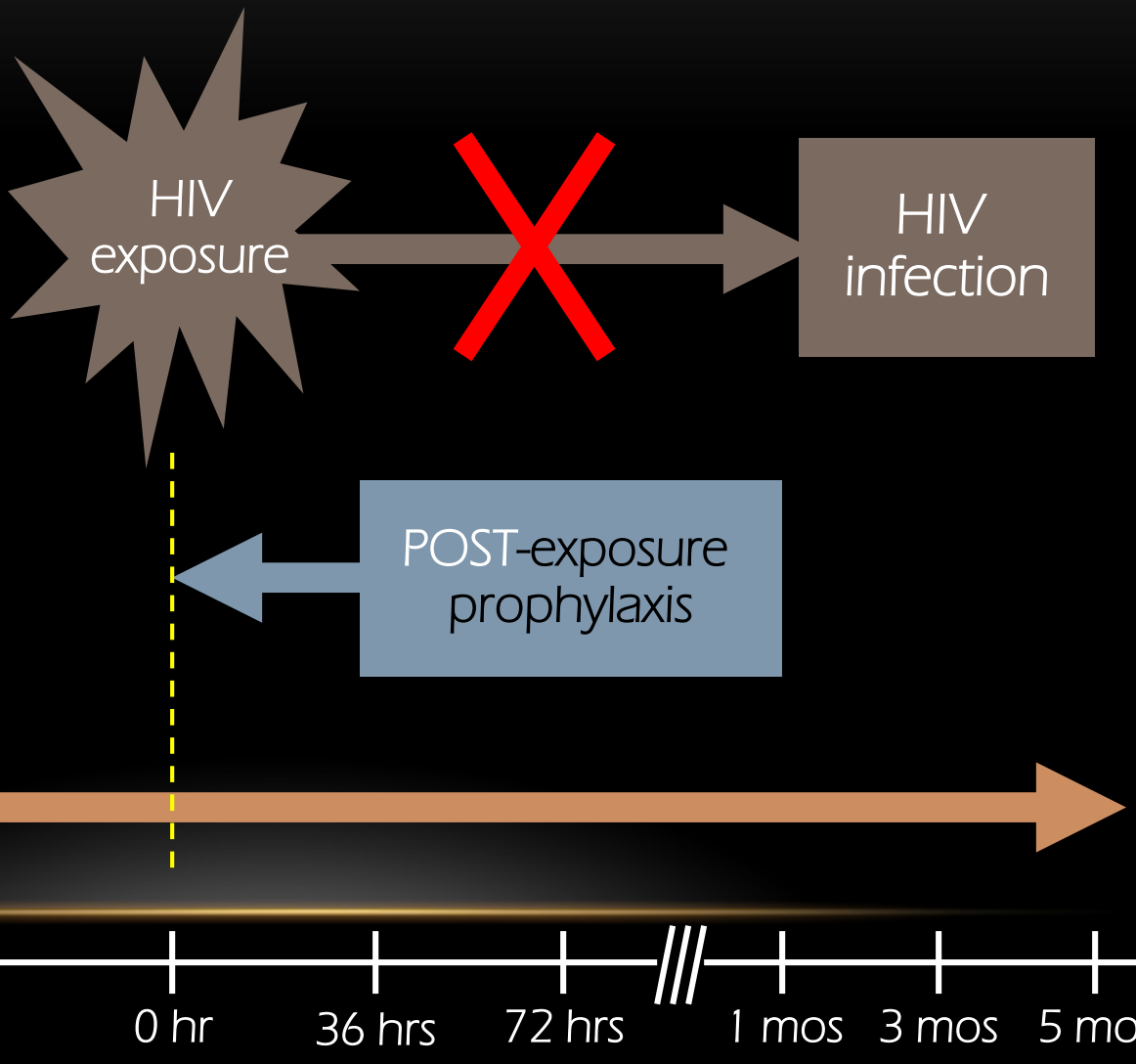
HIV PREVENTION IN 2018

- Post-exposure prophylaxis (PEP)
- Pre-exposure prophylaxis (PrEP)
- Perinatal interventions
- Treatment as prevention ("U=U")
- Behavioral
- Structural/systems-level
- Substance use treatment and harm reduction
- STI control
- Integrated strategies
- Microbicides
- Vaccines
- Male circumcision



PRE- VS POST-EXPOSURE PROPHYLAXIS

- After exposure to HIV, infection may become established
- PEP (initiated soon after exposure) ↓ chance of infection (>>80%)
- PrEP begins antiviral medications before exposure, and is maintained for as long as there is ongoing risk



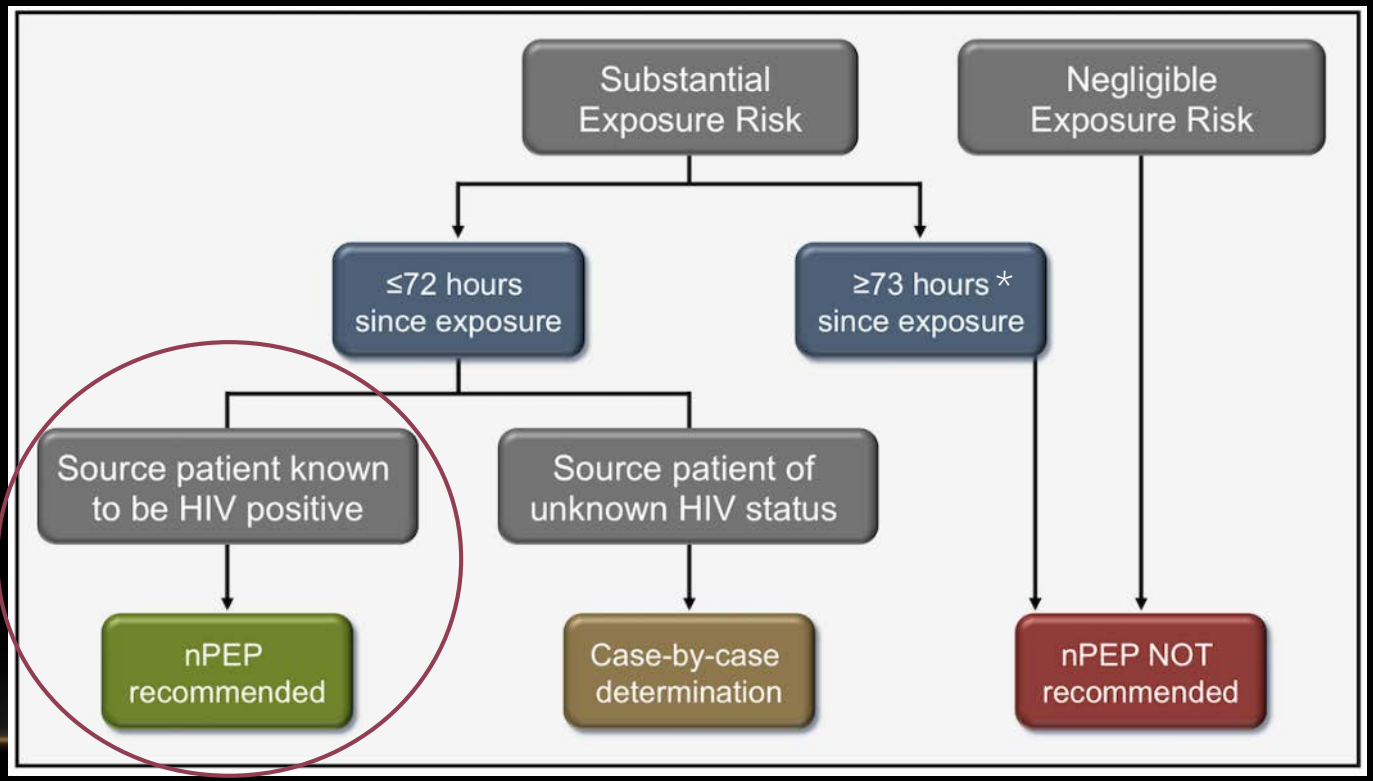
NON-OCCUPATIONAL PEP

- 2016 CDC/DHHS Guidelines : https://stacks.cdc.gov/view/cdc/38856

Clinical assessment algorithm largely unchanged →

Key issues:
- Time since incident
- Knowledge of source person's (SP) HIV status

Food for thought:
- What if SP is on ART with undetectable VL?



* CCC will consider NPEP beyond 72hrs if high risk for HIV transmission (i.e. SP has acute HIV, or not on ART with high HIV viral load)

TRANSMISSION RISK ESTIMATES (CDC)

Table 1.
Estimated Per-Act Probability of Acquiring HIV from an Infected Source, by Exposure Act*

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
Insertive anal intercourse	11
Receptive penile-vaginal intercourse	8
Insertive penile-vaginal intercourse	4
Receptive oral intercourse	Low
Insertive oral intercourse	Low
Other^	
Biting	Negligible
Spitting	Negligible
Throwing body fluids (including semen or saliva)	Negligible
Sharing sex toys	Negligible

*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

RECOMMENDED NPEP COMBINATIONS (CDC/DHHS)

Preferred and Alternative 28-Day Regimens for Nonoccupational PEP[a,b]

Adults and adolescents aged ≥13 years, including pregnant women, with normal renal function (creatinine clearance ≥60 mL/min)

Preferred Regimens:

- Raltegravir (400 mg twice daily) plus tenofovir DF-emtricitabine (300-200 mg once daily) #1
- Dolutegravir (50 mg once daily) plus tenofovir DF-emtricitabine (300-200 mg once daily) #2

Alternative Regimen:

- Darunavir (800 mg once daily) plus ritonavir (100 mg once daily) plus tenofovir DF-emtricitabine (300-200 mg once daily)

#1

#2

CCC PEPLine: 888-448-4911

LAB MONITORING - PEP

Table 4.
nPEP: Recommended Laboratory Monitoring of Source and Exposed Persons

Test	Source	Exposed			
	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 • Tenofovir DF-emtricitabine + dolutegravir				
Serum creatinine (for calculating estimated creatinine clearance)		√	√	—	—
Alanine transaminase, aspartate aminotransferase		√	√	—	—
	For all persons with HIV infection confirmed at any vist				
HIV viral load	√	√[i]			
HIV genotypic resistance	√	√[i]			

Abbreviations: Ag/Ab, antigen/antibody combination test; HIV, human immunodeficiency virus; nPEP, nonoccupational postexposure prophylaxis; tenofovir DF, tenofovir disoproxil fumarate.
[a] Any positive or indeterminate HIV antibody test should undergo confirmatory testing of HIV infection status.
[b] Only if hepatitis C infection was acquired during the original exposure; delayed HIV seroconversion has been seen in persons who simultaneously acquire HIV and hepatitis C infection.
[c] If exposed person susceptible to hepatitis B at baseline.
[d] If exposed person susceptible to hepatitis C at baseline.
[e] If determined to be infected with syphilis and treated, should undergo serologic syphilis testing 6 months after treatment
[f] Testing for chlamydia and gonorrhea should be performed using nucleic acid amplification tests. For patients diagnosed with a chlamydia or gonorrhea infection, retesting 3 months after treatment is recommended.
• For men reporting insertive vaginal, anal, or oral sex, a urine specimen should be tested for chlamydia and gonorrhea.

Images from National HIV Curriculum (https://www.hiv.uw.edu/)

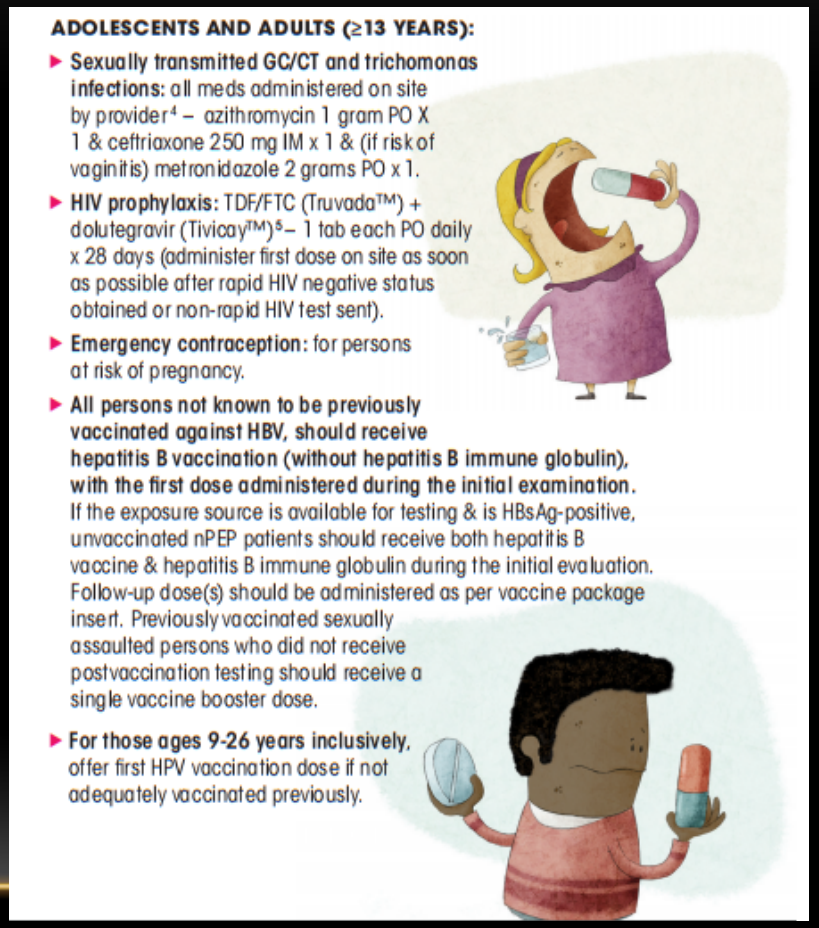
NPEP TOOLKIT – NEW!

Released Spring 2018

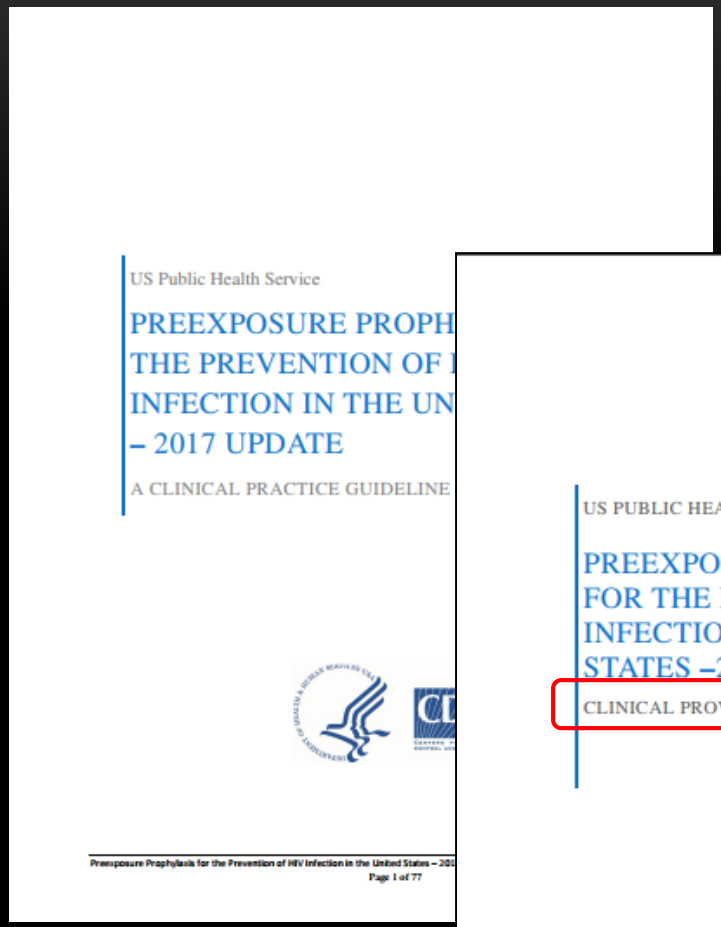
- Developed to raise awareness of NPEP for post-sexual exposure evaluation (including sexual assault)

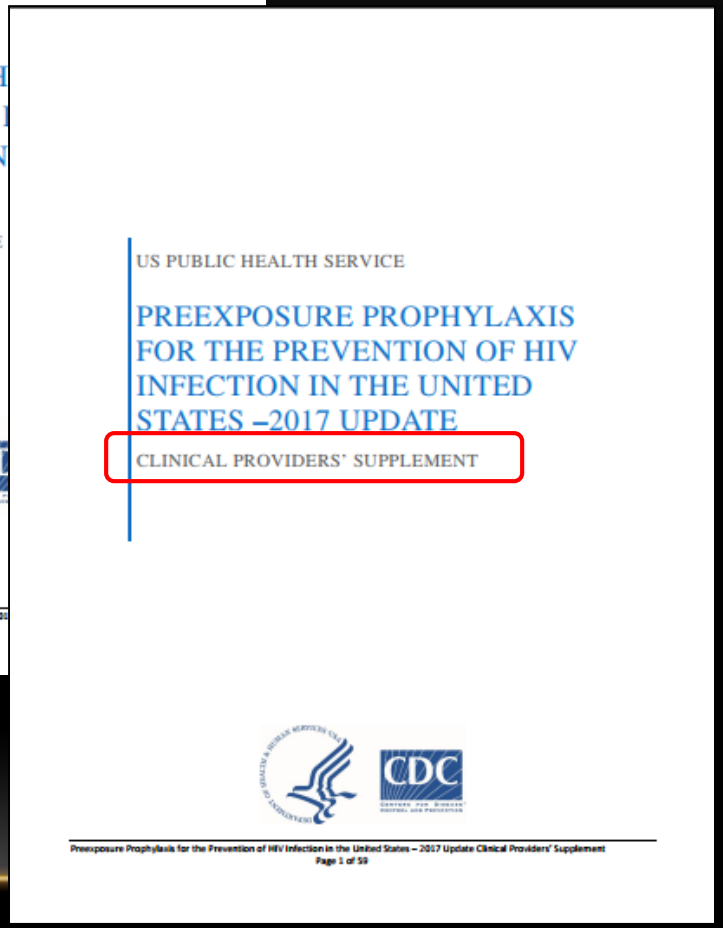
- Kit includes poster, Clinical Pocket Guide, and infographic slides

https://aidsetc.org/resource/post-sexual-exposure-npep-hiv-prevention-toolkit



HOT OFF THE PRESS



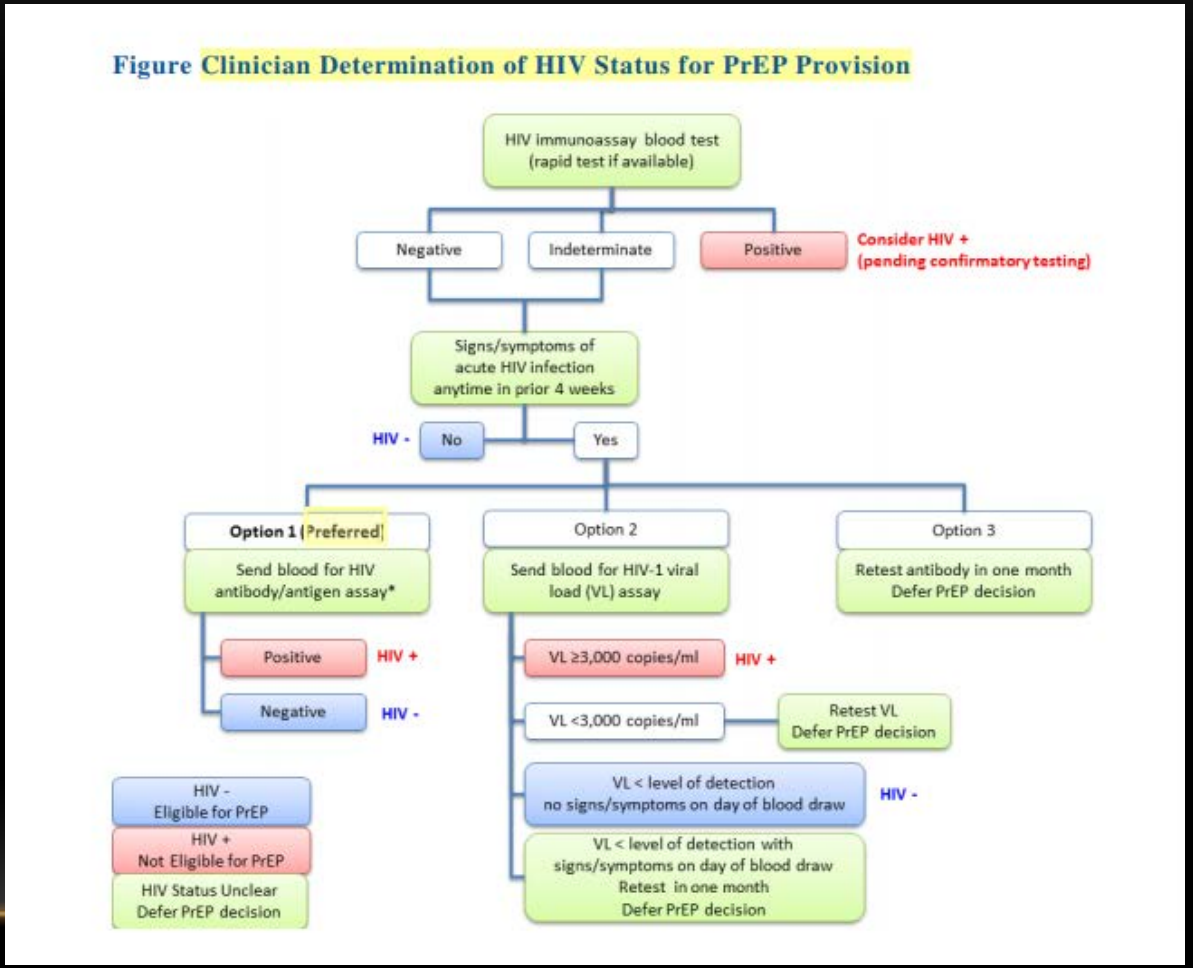


https://www.cdc.gov/hiv/pdf/risk/prep/ cdc-hiv-prep-guidelines-2017.pdf

https://www.cdc.gov/hiv/pdf/risk/prep/ cdc-hiv-prep-provider-supplement-2017.pdf

UPDATED PREP GUIDELINES: WHAT'S NEW?

HIV testing algorithm for PrEP decision- making (page 41) →



CCC PrEPLine: 855-HIV-PREP

NO CHANGE

- Single FDA-approved medication (Truvada™)
- Daily dosing
- HIV screening every 3 months
- Rapid oral assays not recommended for HIV screening with PrEP use
- Renal function assessment every 6 months
- More information needed regarding PrEP use among transgender populations

NEW

- Updated data (adolescents, alternative dosing strategies, PWID)
- Specific guidance if HBsAg positive (PrEP NOT contraindicated, but should monitor closely if PrEP discontinued)
- Specific guidance if patient acquires HIV
- Additional detail on STI (3-site), HCV screening as an important component of PrEP care
- Additional detail on PrEP use in pregnancy, breastfeeding

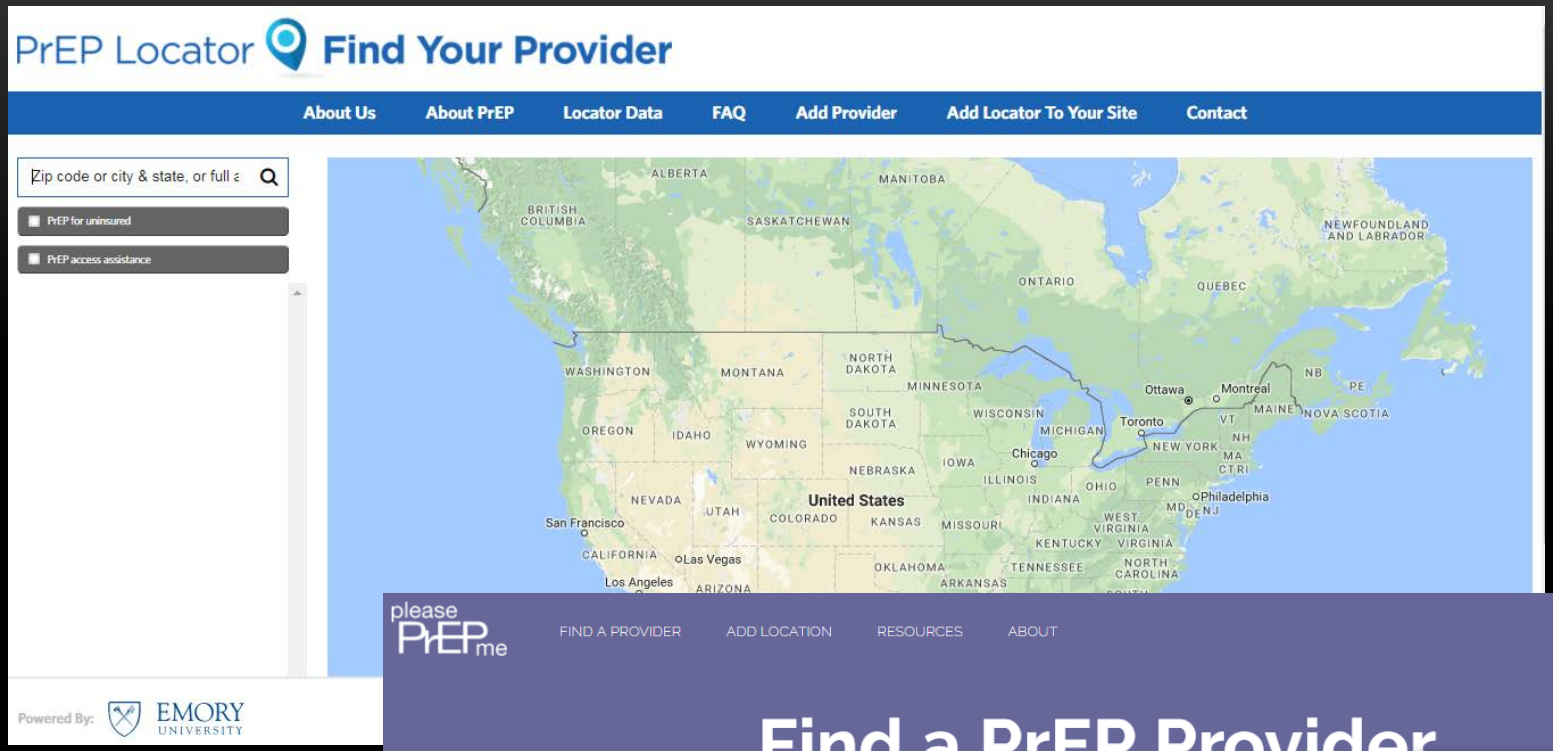
PEP → PREP?

- Delay between the last day of PEP (day 28) and first day of PrEP is <u>not necessary</u>, especially if high HIV risk
- Carefully counsel about transition timing, adherence, and lab testing after transition
  - <u>Perform HIV testing at transition point and assess for signs/symptoms of acute HIV</u>
- Ensure access to PEP and PrEP medications (insurance/ medication assistance paperwork might be different between PEP and PrEP)

PREP → PEP?

- If someone has taken PrEP consistently (i.e. daily) for sufficient length of time and has exposure to HIV, no need to put them on PEP

CCC PrEPLine: 855-HIV-PREP


PrEP Locator Find Your Provider
About Us
About PrEP
Locator Data
FAQ
Add Provider
Add Locator To Your Site
Contact
Zip code or city & state, or full a
PrEP for uninsured
PrEP access assistance
ALBERTA
MANITOBA
BRITISH COLUMBIA
SASKATCHEWAN
NEWFOUNDLAND AND LABRADOR
ONTARIO
QUEBEC
WASHINGTON
MONTANA
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MINNESOTA
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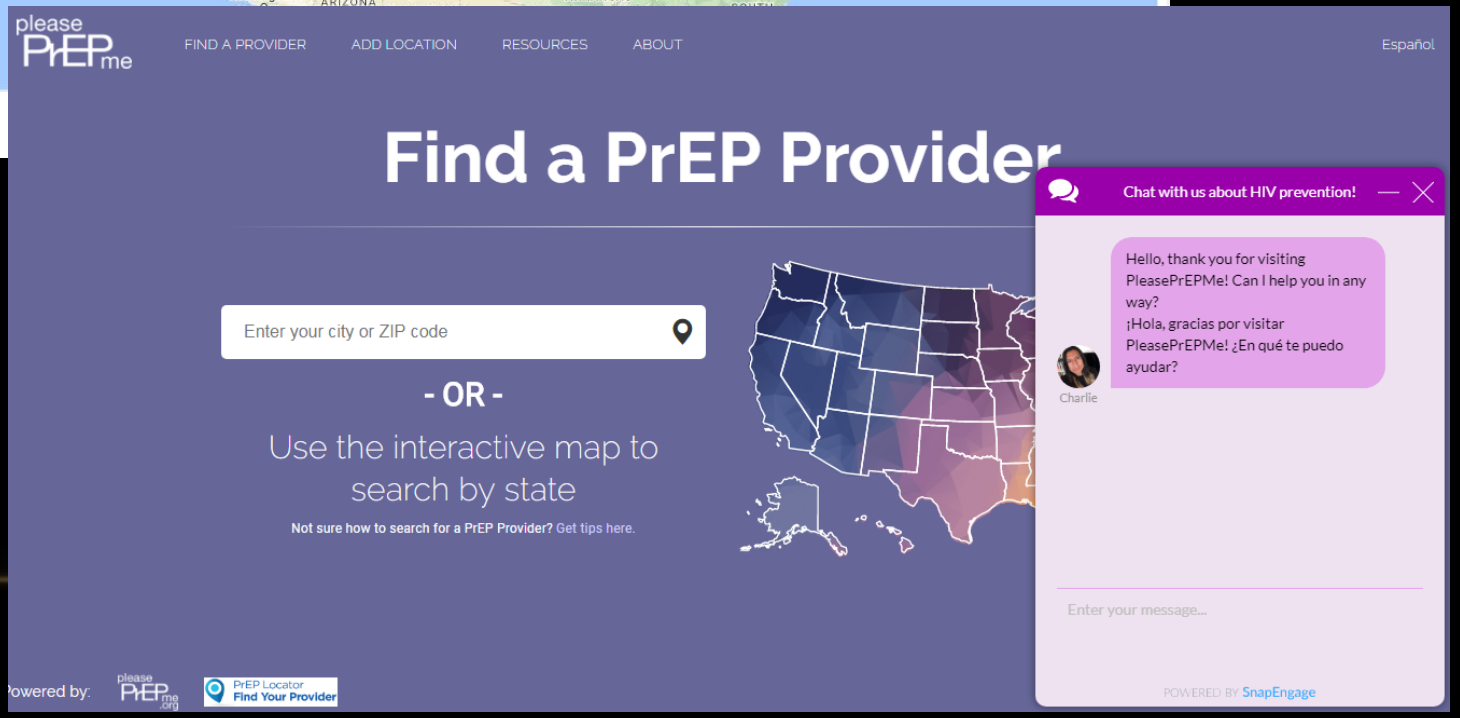
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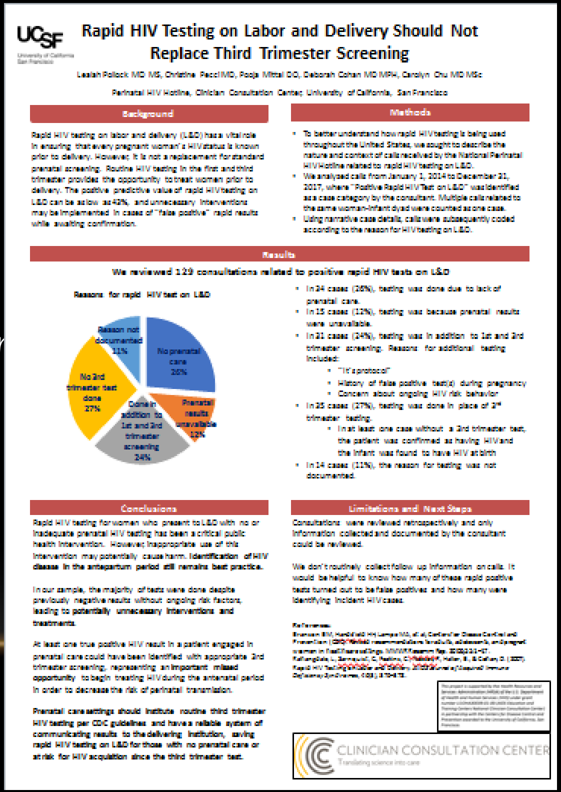
PERINATAL TRANSMISSION PREVENTION: SCREENING

- Comprehensive, timely HIV screening is of utmost importance!
  - Test at entry to prenatal care, and strongly consider repeat screening in 3rd trimester
  - If screening does not occur until Labor & Delivery, "false positive" may lead to potentially unnecessary interve[…] Cesarean delivery) distress for patient/ fa[…] team.



UCSF
University of California San Francisco

Rapid HIV Testing on Labor and Delivery Should Not Replace Third Trimester Screening

Lealah Pollock MD MS, Christine Pecci MD, Pooja Mittal DO, Deborah Cohan MD MPH, Carolyn Chu MD MSc

Perinatal HIV Hotline, Clinician Consultation Center, University of California, San Francisco

Background

Rapid HIV testing on labor and delivery (L&D) has a vital role in ensuring that every pregnant woman's HIV status is known prior to delivery. However, it is not a replacement for standard prenatal screening. Routine HIV testing in the first and third trimester provides the opportunity to treat women prior to delivery. The positive predictive value of rapid HIV testing on L&D can be as low as 42%, and unnecessary interventions may be implemented in cases of "false positive" rapid results while awaiting confirmation.

Methods

- To better understand how rapid HIV testing is being used throughout the United States, we sought to describe the nature and context of calls received by the National Perinatal HIV Hotline related to rapid HIV testing on L&D.
- We analyzed calls from January 1, 2014 to December 31, 2017, where "Positive Rapid HIV Test on L&D" was identified as a case category by the consultant. Multiple calls related to the same woman-infant dyad were counted as one case.
- Using narrative case details, calls were subsequently coded according to the reason for HIV testing on L&D.

Results

We reviewed 129 consultations related to positive rapid HIV tests on L&D

- In 34 cases (26%), testing was done due to lack of prenatal care.
- In 15 cases (12%), testing was because prenatal results were unavailable.
- In 31 cases (24%), testing was in addition to 1st and 3rd trimester screening. Reasons for additional testing included:
  - "It's protocol"
  - History of false positive test(s) during pregnancy
  - Concern about ongoing HIV risk behavior
- In 35 cases (27%), testing was done in place of 3rd trimester testing.
  - In at least one case without a 3rd trimester test, the patient was confirmed as having HIV and the infant was found to have HIV at birth
- In 14 cases (11%), the reason for testing was not documented.

Conclusions

Rapid HIV testing for women who present to L&D with no or inadequate prenatal HIV testing has been a critical public health intervention. However, inappropriate use of this intervention may potentially cause harm. **Identification of HIV disease in the antepartum period still remains best practice.**

In our sample, the majority of tests were done despite previously negative results without ongoing risk factors, **leading to potentially unnecessary interventions and treatments.**

At least one true positive HIV result in a patient engaged in prenatal care could have been identified with appropriate 3rd trimester screening, representing an important missed opportunity to begin treating HIV during the antenatal period in order to decrease the risk of perinatal transmission.

Prenatal care settings should institute routine third trimester HIV testing per CDC guidelines and have a reliable system of communicating results to the delivering institution, saving rapid HIV testing on L&D for those with no prenatal care or at risk for HIV acquisition since the third trimester test.

Limitations and Next Steps

Consultations were reviewed retrospectively and only information collected and documented by the consultant could be reviewed.

We don't routinely collect follow up information on calls. It would be helpful to know how many of these rapid positive tests turned out to be false positives and how many were identifying incident HIV cases.

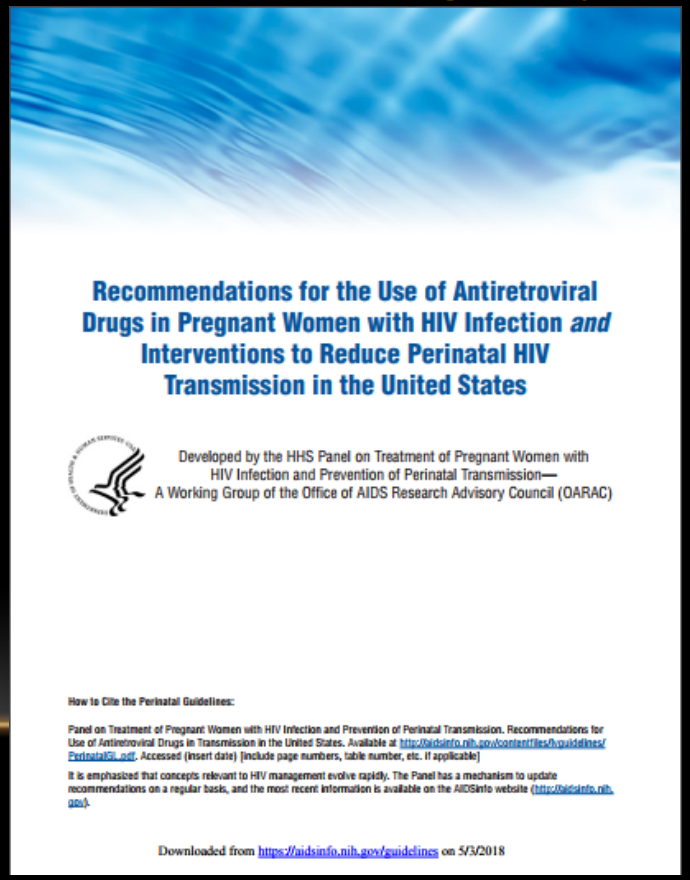
References
[illegible]

[illegible]

CLINICIAN CONSULTATION CENTER
Translating science into care

PERINATAL TRANSMISSION PREVENTION: TREATMENT

- Pregnant women living with HIV should be started/ maintained on ART as early as possible, and remain virologically suppressed through entire pregnancy
  - No more efavirenz (Sustiva®) restriction
  - Avoid EVG/cobi/F/TAF (Genvoya®), EVG/cobi/F/TDF (Stribild®) due to ↓↓ drug levels in pregnancy
  - Insufficient evidence to make recommendation for or against F/TAF (Descovy®)



Recommendations for the Use of Antiretroviral Drugs in Pregnant Women with HIV Infection *and* Interventions to Reduce Perinatal HIV Transmission in the United States

Developed by the HHS Panel on Treatment of Pregnant Women with HIV Infection and Prevention of Perinatal Transmission—
A Working Group of the Office of AIDS Research Advisory Council (OARAC)

How to Cite the Perinatal Guidelines:

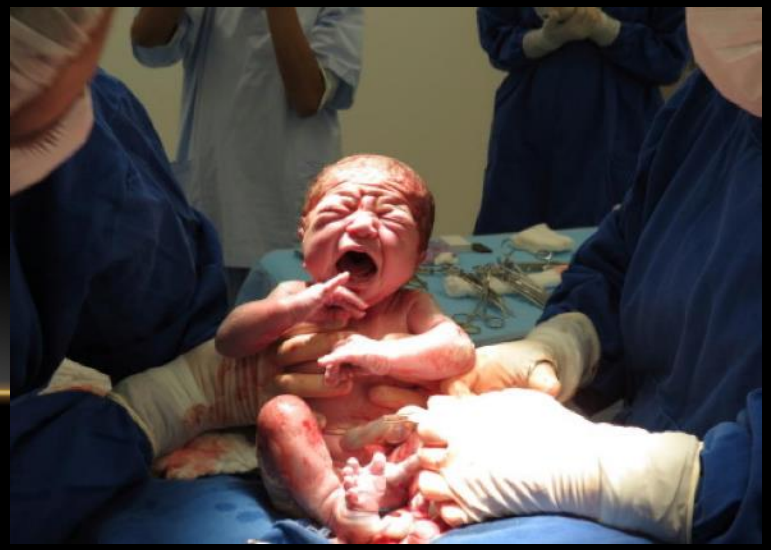
Panel on Treatment of Pregnant Women with HIV Infection and Prevention of Perinatal Transmission. Recommendations for Use of Antiretroviral Drugs in Transmission in the United States. Available at http://aidsinfo.nih.gov/contentfiles/lvguidelines/PerinatalGL.pdf. Accessed (insert date) [include page numbers, table number, etc. if applicable]

It is emphasized that concepts relevant to HIV management evolve rapidly. The Panel has a mechanism to update recommendations on a regular basis, and the most recent information is available on the AIDSinfo website (http://aidsinfo.nih.gov).

CCC Perinatal HIV Hotline: 888-448-8765

PERINATAL TRANSMISSION PREVENTION: LABOR & DELIVERY

- Scheduled Cesarean still recommended at [illegible]3 weeks if HIV viral load (VL) near term unknown or > 1000 copies/mL.
- If woman presents in spontaneous labor or after rupture of membranes, and VL > 1000 copies/mL (or unknown), insufficient evidence to determine if Cesarean reduces transmission risk. Decision should be individualized.
- Administer IV AZT during labor (and prior to Cesarean) if [illegible] copies/mL.
  - Consider if VL b/t 50 & 999
  - Optional if VL ≤ 50 with good ART adherence



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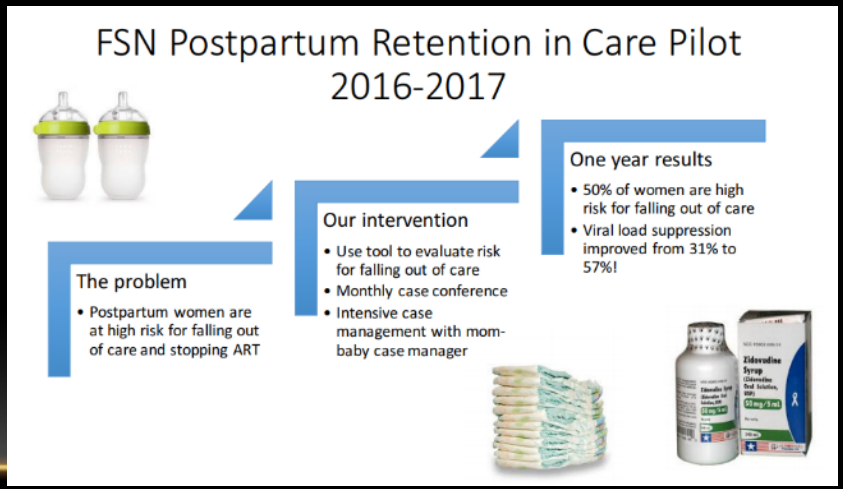
PERINATAL TRANSMISSION PREVENTION: POSTPARTUM

- Women living with HIV are at high risk for loss-to-follow-up and low ART adherence during postpartum period
  - Competing needs: infant care, multiple appointments
  - Postpartum depression, psychosocial stressors

- Co-located, coordinated mother and infant services can help address maternal health (physical and mental), infant HIV testing completion, and support entire family's needs



CCC Perinatal HIV Hotline: 888-448-8765

PERINATAL TRANSMISSION PREVENTION: BREASTFEEDING

- Although breastfeeding is not recommended for women living with HIV in the U.S., some may still choose to do so despite intensive counseling
- Harm reduction measures should be discussed:
  - Maternal ART adherence with virologic suppression
  - Engagement in care (both mother and infant)
  - Avoidance of rapid weaning
  - Infant prophylaxis with ART
  - Regular HIV screening for infant

CCC Perinatal HIV Hotline: 888-448-8765

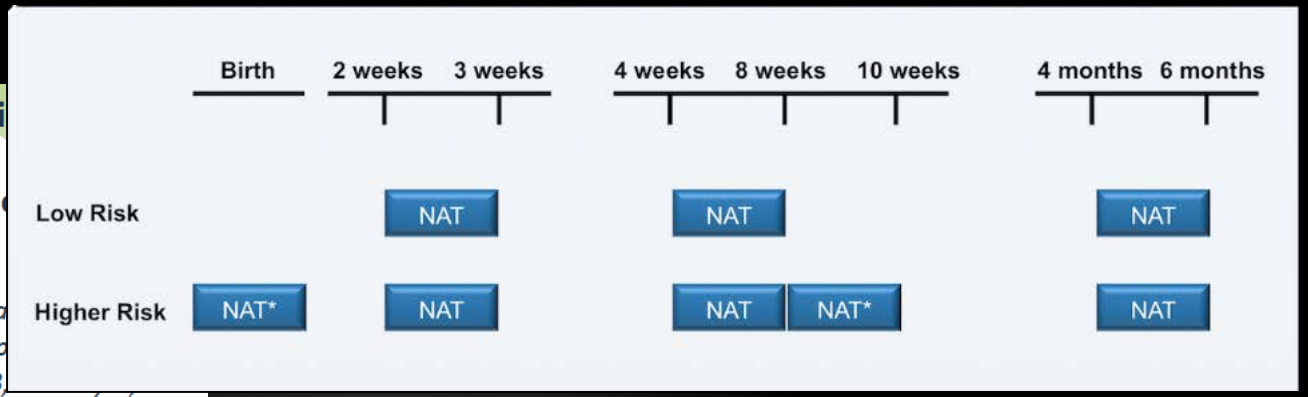
PERINATAL TRANSMISSION PREVENTION: INFANT MGMT

- Zidovudine (AZT) for 4 weeks if low risk
- Combination infant prophylaxis (AZT, nevirapine, +/- lamivudine) if elevated risk
- Repeat HIV testing for exposed infants at multiple, specific time points to determine if transmission occurred

Raltegravir (RAL) Pharmacoki
and Safety in HIV-1 Exposed
at High Risk of Infecti
IMPAACT P1110

Clarke DF, Acosta EP, Chain A, Cababasa
Calabrese K, Spector SA, Bryson YJ, Tepp
Graham B, Smith B, Hazra R, Homony B,
Mirochnick M, and the P1110 Protocol Team

Quantitative Solutions
MSD
IMPAACT International Maternal Pediatric Adolescent AIDS Clinical Trials Network



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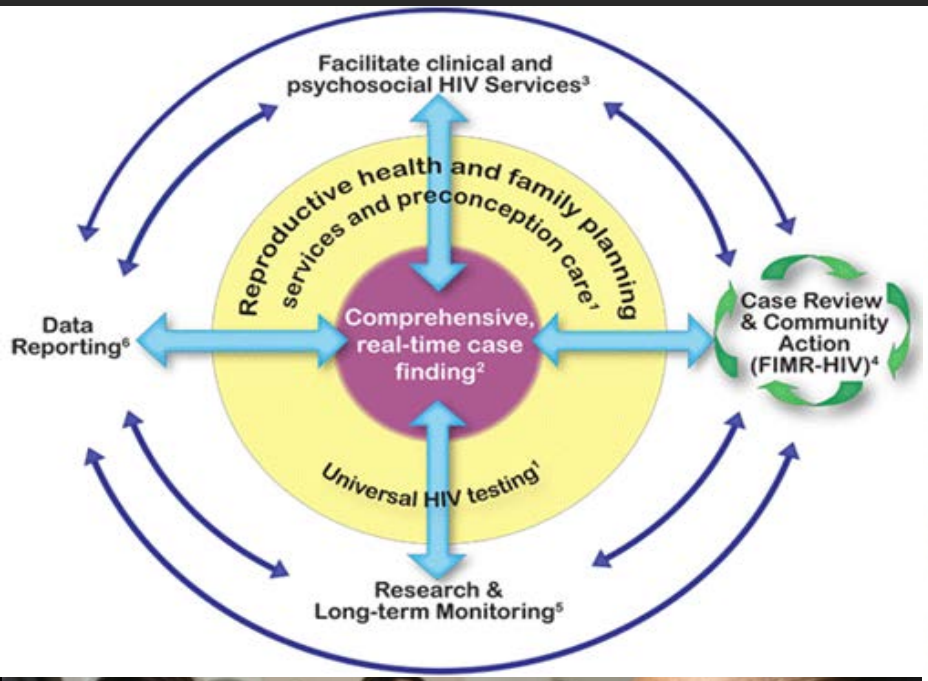
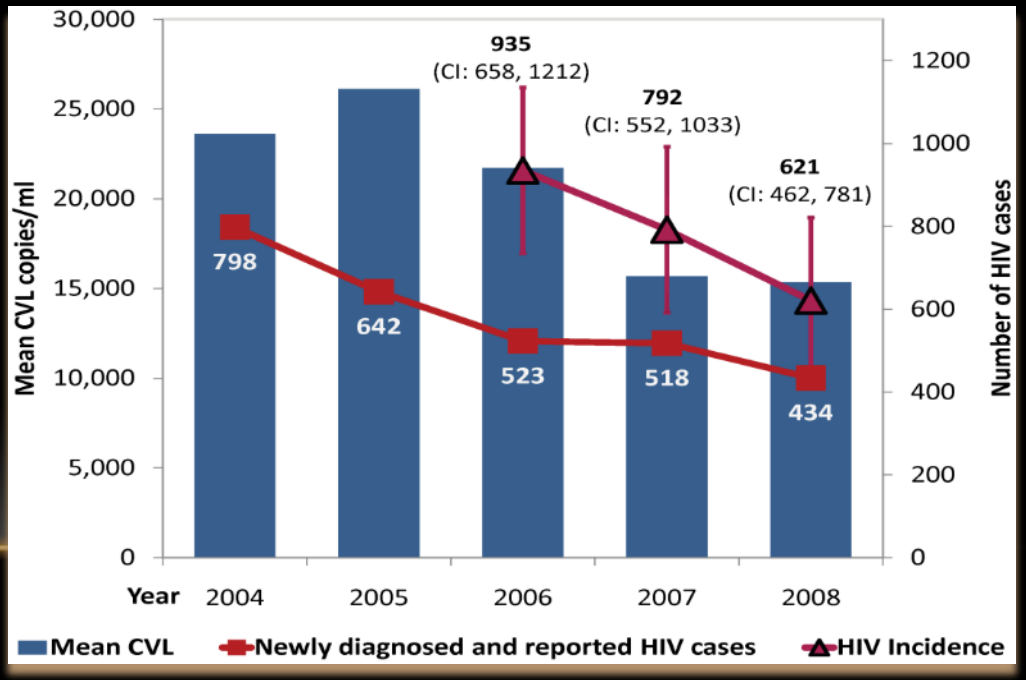


Missed Opportunities	Prevention Opportunities
HIV-infected woman: known status HIV-infected woman: unknown status	Primary HIV prevention for women and girls
No Preconception Care Become Pregnant	Adequate preconception care and family planning services
No Prenatal Care	Accessible, affordable, welcoming prenatal care
No HIV Test	Universal prenatal HIV testing (routine, opt-out)
Inadequate ARV Prophylaxis	Providing ARV prophylaxis to all eligible
No Cesarean Delivery	Utilize Cesarean delivery if maternal viral load is >1000 copies/ml
Breastfed Infant	Education and support on avoidance of breastfeeding
Child Infected Despite Treatment	Comprehensive services for mother and infant

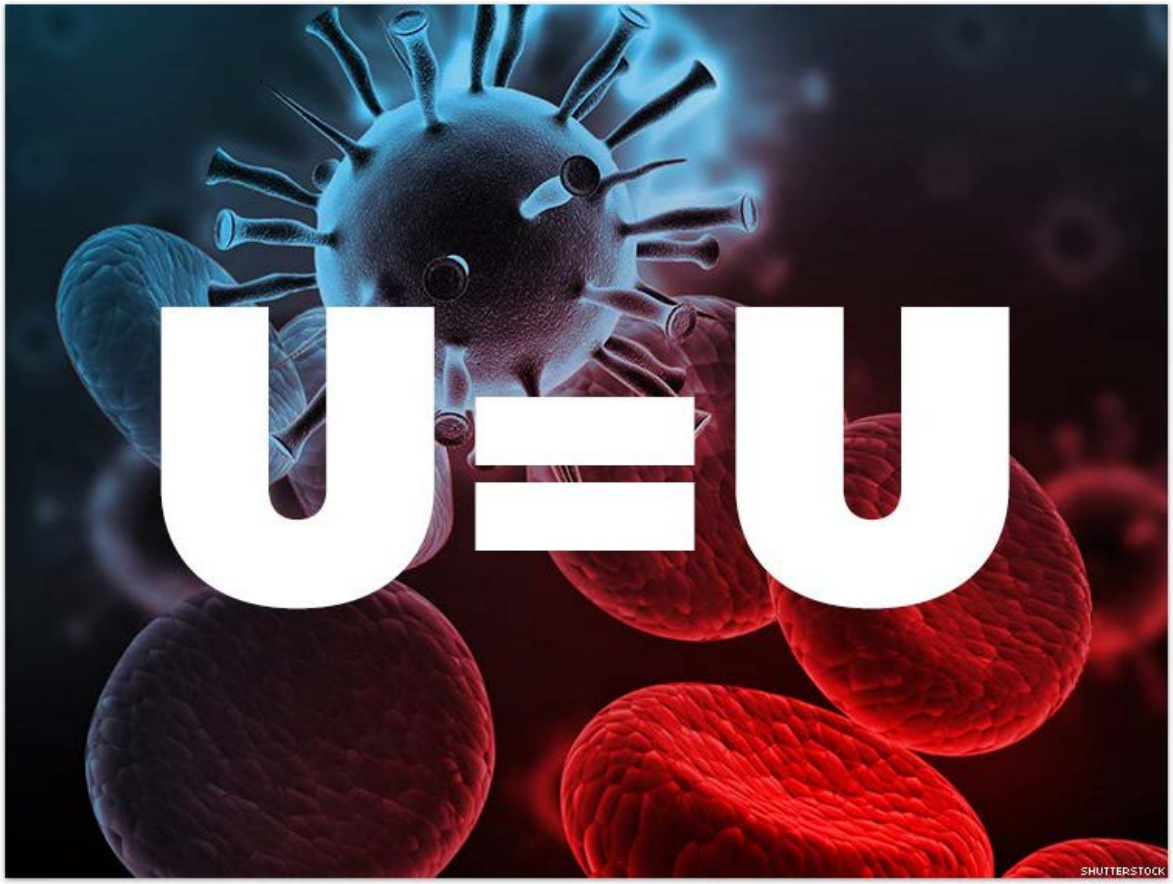
HIV "TREATMENT AS PREVENTION"

Type of Event	Event Rate/100 PY (95% CI)		HR (95% CI)	*P* Value
	Early ART	Deferred ART		
Transmission	0.3 (0.1-0.6)	2.2 (1.6-3.1)	0.11 (0.04-0.32)	< .001
Clinical event	2.4 (1.7-3.3)	4.0 (3.5-5.0)	0.59 (0.40-0.88)	< .001



TREATMENT ▶ TREATMENT

CDC Officially Admits People With HIV Who Are Undetectable Can't Transmit HIV



In a historic letter, the Centers for Disease Control and Prevention support the science behind "Undetectable Equals Untransmittable."

TODAY'S TOPICS

- Epidemiology updates
- HIV prevention
- Testing
- Antiretroviral therapy options and treatment strategies
- Primary care and HIV
- HIV and substance use

What Does the Generalist Need to Know About HIV Infection?

Joel E. Gallant

Despite recent improvements in the efficacy, safety, tolerability, and convenience of antiretroviral therapy for patients, the management of HIV infection remains complex for clinicians. Multiple studies have shown better clinical outcomes and lower cost of care when HIV-infected patients are managed by experts. However, generalists are frequently involved in the care of patients with HIV infection, in many cases providing primary care in collaboration with an HIV expert. Generalists also play a critical role in the diagnosis and prevention of HIV infection. Generalists managing HIV-infected patients should be aware of the components of the initial patient evaluation. They should be familiar with the general principles of antiretroviral therapy and opportunistic infection prevention. They should be able to recognize antiretroviral toxicity and should be aware of common drug-drug interactions involving antiretroviral agents.

Key Words: HIV, Antiretroviral therapy, Primary care, Expertise

There is broad consensus that HIV-infected patients should be managed under the direction of an HIV expert. Expert care is associated with reduced morbidity, mortality, and cost of care,[1-6] reflecting the complexity of HIV infection and its treatment. However, the model of care that was popular in the early years of the acquired immune deficiency syndrome (AIDS) epidemic, in which experts provided comprehensive primary and specialty care to HIV-infected patients, may no longer be viable in all settings. Although the number of HIV-infected patients increases, the number of HIV experts appears to be shrinking. As a result of the effectiveness of antiretroviral therapy (ART) and the aging of the HIV-infected population, HIV disease is often low on the list of medical priorities for many patients. Some HIV experts, many of whom are trained in infectious diseases, may be neither inclined nor qualified to provide primary care for an aging population. As more infected patients become "mainstreamed" into general medical practices, generalists will need to have a basic understanding of the management of HIV-positive patients.

The generalist who provides primary care problems, the patient may be seen regularly by the generalist, the expert, and possibly other subspecialists, with care coordinated by the generalist. HIV-infected patients who live in small towns or rural communities may not have easy access to an HIV expert. However, care can still be guided by an expert with infrequent visits (in person or by telemedicine) and regular communication between the generalist and the expert by e-mail, telephone, or fax.

I have used the term "expert" rather than "specialist" in this discussion in part because there are currently no specialty boards for HIV medicine nor is there any required form of training. Many experts are infectious

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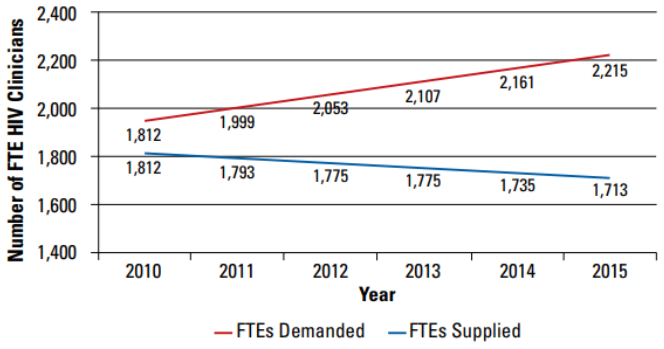
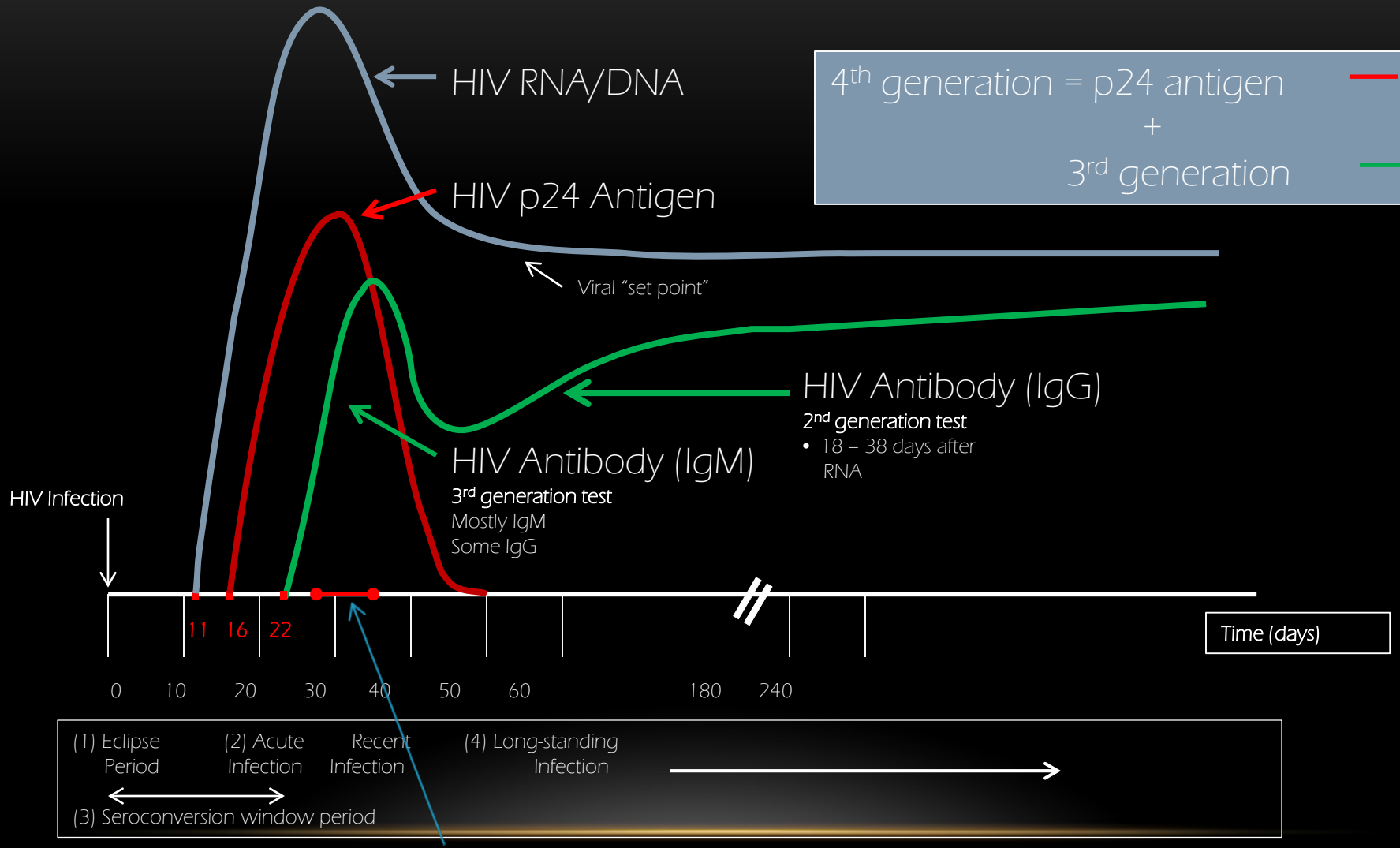
Figure 1. Forecasted Supply and Demand of FTE HIV Clinicians, 2010–2015



FTE = full-time equivalent.

Sources: HIV Clinician Workforce Survey 2012, NAMCS (2009), NHAMCS (2008), HCUP-NIS (2002–2009), and federal and state HIV surveillance data (2008).

Sequence of lab marker appearance for HIV-1



Traditional rapid Ab assays detect @ days ~28-35

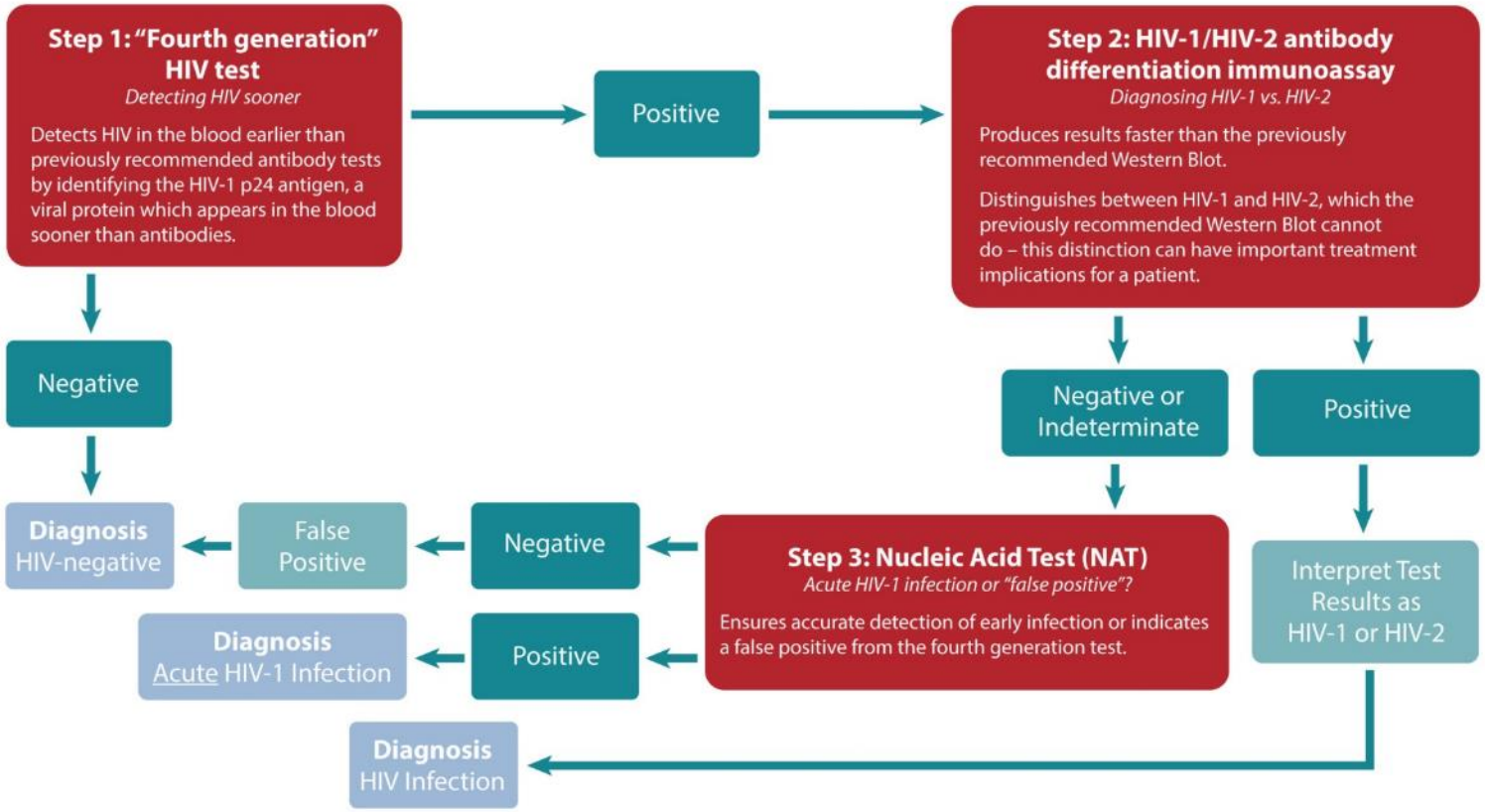
ADAPTED FROM "LABORATORY TESTING FOR THE DIAGNOSIS OF HIV INFECTION: UPDATED RECOMMENDATIONS," JUNE 27, 2014, CENTERS FOR DISEASE CONTROL AND PREVENTION

(2014) 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

INTERPRETATION/REPORTING OF RESULTS

Guidance for Reporting Results from the HIV Laboratory Diagnostic Testing Algorithm for Serum and Plasma Specimens[a]

Test Outcomes

Test Sequence			Final Algorithm Interpretation[d]	Interpretation for Provider[e] (Sample should be reported as:)	Further Actions[f]
Step 1	Step 2	Step 3			
HIV-1/HIV-2 Ag/Ab IA[b]	HIV-1/HIV-2 Antibody Differentiation IA[c]	HIV-1 NAT			
Nonreactive	n/a	n/a	HIV-1 antigen and HIV-1/HIV-2 antibodies were not detected. No laboratory evidence of HIV infection.	HIV negative	If recent HIV exposure is suspected or reported, conduct HIV-1 NAT or request a new specimen and repeat the algorithm according to CDC guidance.[g]
Reactive	HIV-1 Positive	n/a	Positive for HIV-1 antibodies. Laboratory evidence of HIV-1 infection is present.	HIV-1 Positive	Link patient to HIV medical care and provide appropriate prevention counseling.[h]
Reactive	HIV-2 Positive	n/a	Positive for HIV-2 antibodies. Laboratory evidence of HIV-2 infection is present.	HIV-2 Positive	Link patient to HIV medical care and provide appropriate prevention counseling.[h]
Reactive	HIV-2 Positive with HIV-1 Cross reactivity	n/a	Positive for HIV-2 antibodies. Laboratory evidence of HIV-2 infection is present.	HIV-2 Positive. This result is distinct from HIV positive untypable (undifferentiated).	Link patient to HIV medical care and provide appropriate prevention counseling.[h]
Reactive	HIV Positive untypable (undifferentiated)	n/a	Positive for HIV-1 and HIV-2 antibodies. Laboratory evidence of HIV-1 and/or HIV-2 infection is present.	HIV Positive	Link patient to HIV medical care and provide appropriate prevention counseling.[h] Provider may consider additional testing for HIV-1 RNA or DNA and HIV-2 RNA or DNA to verify or rule out HIV-1/HIV-2 dual infection. Request additional specimen if original specimen volume is insufficient.
Reactive	HIV-1 indeterminate, HIV-2 indeterminate[i], HIV indeterminate	Detected	Positive for HIV-1. Laboratory evidence of HIV-1 infection consistent with an **acute** HIV-1 infection.	**Acute** HIV-1 Positive	Link patient to HIV medical care and provide appropriate prevention counseling immediately[h] to expedite prevention practices.
Reactive	HIV-1 indeterminate	Not detected	HIV-1 antibodies were not confirmed and HIV-1 RNA was not detected.	HIV Negative	If recent HIV exposure is suspected or reported, request a new specimen and repeat the algorithm according to CDC guidance.[g]
Reactive	HIV-2 indeterminate[i]	Not detected	HIV antibodies were not confirmed and HIV-1 RNA was not detected. HIV-2 inconclusive.	HIV-1 Negative, HIV-2 inconclusive	Refer sample for testing with a different validated supplemental HIV-2 test (antibody test or NAT) if available. Alternatively, redraw and repeat algorithm in 2-4 weeks to assess HIV-2 infection.
Reactive	HIV Indeterminate	Not detected	HIV-1 antibodies were not confirmed and HIV-1 RNA was not detected. HIV-2 inconclusive.	HIV-1 Negative, HIV-2 inconclusive	Refer sample for testing with a different validated supplemental HIV-2 test (antibody test or NAT) if available. Alternatively, redraw and repeat algorithm in 2-4 weeks to assess HIV-2 infection.
Reactive	Negative	Detected	Positive for HIV-1. Laboratory evidence of HIV-1 infection consistent with an **acute** HIV-1 infection.	**Acute** HIV-1 Positive	Link patient to HIV medical care and provide appropriate prevention counseling immediately[h] to expedite prevention practices.
Reactive	Negative	Not detected	HIV antibodies were not confirmed and HIV-1 RNA was not detected.	HIV Negative	If recent HIV exposure is suspected or reported, request a new specimen and repeat the algorithm according to CDC guidance.[g]
Reactive	Negative or Indeterminate	Invalid or not performed	Inconclusive	Inconclusive	Request an additional specimen and repeat the algorithm. Ensure HIV-1 NAT is performed, if indicated by results of HIV-1/HIV-2 Ag/Ab IA and HIV-1/HIV-2 Ab differentiation IA.

CCC HIV Warmline: 800-933-3413

https://stacks.cdc.gov/view/cdc/50872
https://www.cdc.gov/hiv/testing/laboratorytests.html

Advantages and Disadvantages of FDA-Approved HIV Assays Used for Screening, *by test category*

Test Category [a]	HIV Screening Tests	Run Time	Instrument	Report Ag and Ab separately	Detects IgG	Detects IgM	Uses whole blood (WB) specimens	Uses oral fluid (OF) specimens	Uses dried blood spot specimens	Least complex[b] CLIA category	External quality control not required in each run
Nucleic acid laboratory test	Aptima HIV-1 RNA Qualitative Assay[c]	>3 hours	semi-automated							high	
Ag/Ab laboratory test	ADVIA Centaur HIV Ag/Ab Combo (CHIV) Assay	<1 hour	automated		✓	✓				moderate	✓
	Architect HIV Ag/Ab Combo Assay	<30 mins	automated		✓	✓				moderate	✓
	BioPlex 2200 HIV Ag-Ab	45 mins	automated	✓	✓	✓				moderate	✓
	GS HIV Combo Ag/Ab EIA	>3 hours	semi-automated		✓	✓				high	
Ag/Ab rapid test	Determine HIV-1/2 Ag/Ab Combo	20 mins	single-use	✓	✓	✓	✓			waived	✓
Ab laboratory test	ADVIA Centaur HIV 1/O/2 Enhanced (EHIV) Assay	<1 hour	automated		✓	✓				moderate	
	Avioq HIV-1 Microelisa System	<3 hours	semi-automated		✓	✓		✓	✓	high	
	GS HIV-1/2 Plus O	>3 hours	semi-automated		✓	✓				high	
	Vitros Anti-HIV 1+2	<1 hour	automated		✓	✓				moderate	✓
Ab rapid test	DPP HIV-1/2 Assay	10 mins WB/ 25 mins OF	single-use		✓		✓	✓		waived	✓
	HIV 1/2 STAT-PAK	15 mins	single-use		✓		✓			waived	✓
	INSTI HIV-1/HIV-2 Antibody Test	<2 mins	single-use		✓	✓	✓			waived	✓
	OraQuick ADVANCE Rapid HIV-1/2 Antibody Test	20 mins	single-use		✓	✓	✓	✓		waived	✓
	Reveal G4 Rapid HIV-1 Antibody Test	<2 mins	single-use		✓		✓			moderate	✓
	SURE CHECK HIV 1/2 Assay	15 mins	single-use		✓		✓			waived	✓
	Uni-Gold Recombigen HIV	10 mins	single-use		✓	✓	✓			waived	✓

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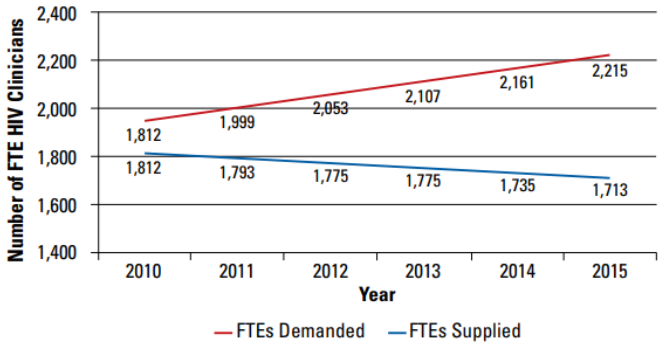

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Sources: HIV Clinician Workforce Survey 2012, NAMCS (2009), NHAMCS (2008), HCUP-NIS (2002–2009), and federal and state HIV surveillance data (2008).

RAPID ART FOR NEW HIV DIAGNOSES ("RAPID"- SAN FRANCISCO)

- ART initiation recommended as soon as possible; some recommend ART be offered on day of diagnosis where feasible[1-3]
- San Francisco "Getting to Zero" Consortium's Citywide RAPID program: accelerated ART initiation for new diagnoses[4]
  - All new confirmed HIV diagnoses linked to care within 5 working days
  - 1st visit: labs, counseling, medical/psychosocial assessment, ART started unless risk for fatal immune reconstitution inflammatory syndrome
  - Combination ART: (INSTI or DRV/RTV) + FTC/tenofovir (consider expanded regimen if HIV acquired while on PrEP)
  - Linkage navigators utilize RAPID Provider Directory to identify best clinic/provider match

1. DHHS Guidelines, Oct 2017. 2. Günthard HF, et al. JAMA. 2016;316:191-210. 3. WHO, July 2017. 4. Bacon O, et al. CROI 2018. Abstract O93.

RAPID ART IN SF: CARE LINKAGE, ART INITIATION, AND VIROLOGIC SUPPRESSION

Outcome	2013	2014	2015	2016	% Change
Diagnosed, n	399	329	295	265	–
Started ART, n (%)	311 (78)	276 (84)	244 (83)	215 (81)	–
Met RAPID definition, n (%)	23 (6)	45 (14)	50 (17)	80 (30)	–
In care within 1 year, n (%)	372 (93)	318 (97)	282 (96)	258 (97)	–
Median time from diagnosis to care entry, days	8	7	7	5	-38
Median time from first care visit to ART initiation, days	27	17	6	1	-96
Median time from ART start to HIV-1 RNA < 200 copies/mL, days	70	53	50	38	-46
Median time from diagnosis to HIV-1 RNA < 200 copies/mL, days	134	92	77	61	-54

Bacon O, et al. CROI 2018. Abstract O93.

Slide credit: clinicaloptions.com

DHHS, IAS-USA GUIDELINES: RECOMMENDED FIRST-LINE ART OPTIONS

Class	DHHS[1]	IAS-USA*[2]
INSTI	**BIC/TAF/FTC** (approved March 2018) **DTG/ABC/3TC** DTG + (TAF or TDF)/FTC **EVG/COBI/(TAF or TDF)/FTC** RAL + (TAF or TDF)/FTC	– **DTG/ABC/3TC** DTG + TAF/FTC **EVG/COBI/TAF/FTC** RAL + TAF/FTC

- Recommendations may differ based on initial HIV viral load, CD4 cell count, CrCl, eGFR, HLA-B*5701 status, HBsAg status, and osteoporosis status
- With FDA approval of 1200-mg RAL,[3] all options now available as once-daily combinations (except in pregnancy)

Bold text = single-tablet combinations

*IAS-USA guidelines not updated since approval of BIC/TAF/FTC

1. DHHS guidelines. March 2018. 2. Günthard HF, et al. JAMA. 2016;316:191-210. 3. Raltegravir [package insert]. 2018.

Slide credit: clinicaloptions.com

MANAGEMENT OF ART-EXPERIENCED PATIENTS

- If "failing" current combination (inability to achieve/maintain VL < 200 copies/mL), obtain comprehensive history about prior ART and response, and prior/current HIV resistance testing results, to identify optimal regimen. Expert input strongly advised.
- If considering treatment "switch" (to decrease # of pills, reduce risk of side effects/toxicity, etc.), obtain history about prior ART use and response, and prior HIV resistance testing results before modifying therapy. Expert input strongly advised.

- Don't forget about medication interactions!

  https://www.hiv-druginteractions.org/checker (Liverpool)

  https://hivclinic.ca/drug-information/drug-interaction-tables/ (Toronto)

  https://aidsinfo.nih/gov/guidelines/html/1/adult-and-adolescent-arv/367/overview (DHHS)

CCC HIV Warmline: 800-933-3413

DTG/RPV (JULUCA®) APPROVED FOR MAINTENANCE THERAPY: NOVEMBER 2017

- Once-daily single-tablet regimen (STR): first 2-drug STR approved by FDA for use as a complete regimen in the U.S.

Key U.S. Label Information	
Indication	Should be virologically suppressed for ≥ 6 months Should have no history of treatment failure and no resistance to DTG or RPV components Consider if wanting to avoid NRTI class
Administration requirements	Must be taken with a meal
Key interactions	Separate dose of DTG/RPV and antacid/polyvalent cation–containing medications Avoid PPIs (eg, omeprazole, pantoprazole)
Dose adjustments	None required for patients with mild/moderate renal impairment; in patients with CrCl < 30 mL/min, increase monitoring for adverse events

DTG/RPV [package insert]. 2018. DHHS guidelines. March 2018.

Slide credit: clinicaloptions.com

ART-EXPERIENCED PATIENTS WITH MULTIDRUG-RESISTANT HIV: IBALIZUMAB (TROGARZO™) APPROVED MARCH 2018

- Ibalizumab: humanized monoclonal Ab to CD4 receptor that blocks HIV entry into CD4 T-cells[1]
  - Administered as IV injection for heavily treatment–experienced adults with multidrug-resistant HIV infection and virologic failure
- Single-arm, open-label phase III trial (n = 40)[2,3]

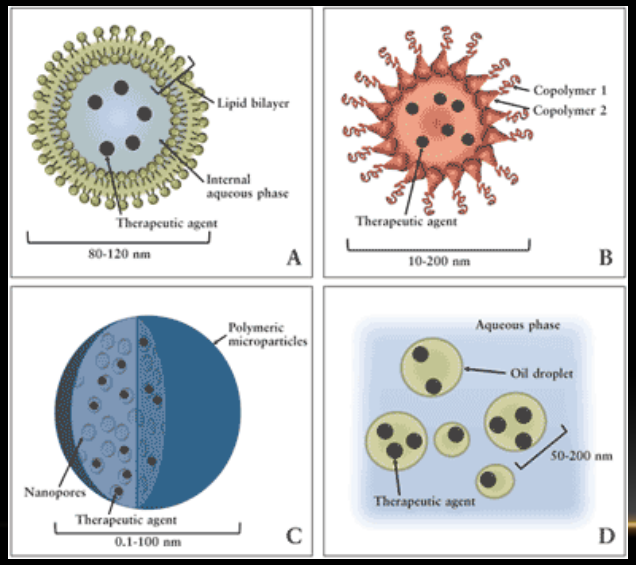
Virologic Outcome- 24 weeks	Ibalizumab + Optimized Background Regimen
≥ 1.0 $\log_{10}$ HIV-1 RNA decrease, %	55
HIV-1 RNA < 200 copies/mL, %	50
Mean HIV-1 RNA decrease from BL, $\log_{10}$	1.6

1. Ibalizumab [package insert]. 2018. 2. Emu B, et al. IDWeek 2017. Abstract 1686. 3. ClinicalTrials.gov. NCT02475629.

Slide credit: clinicaloptions.com

THE FUTURE: LONG-ACTING INJECTABLE ART?

- Can be given IM every 1-2 months
- Might be especially useful for patients who have difficulty keeping frequent appointments
- Need to balance possible benefit with risk for toxicity and reversibility



TODAY'S TOPICS

- Epidemiology updates
- HIV prevention
- Testing
- Antiretroviral therapy strategies and treatment options
- Primary care and HIV
- HIV and substance use

What Does the Generalist Need to Know About HIV Infection?

Joel E. Gallant

Despite recent improvements in the efficacy, safety, tolerability, and convenience of antiretroviral therapy for patients, the management of HIV infection remains complex for clinicians. Multiple studies have shown better clinical outcomes and lower cost of care when HIV-infected patients are managed by experts. However, generalists are frequently involved in the care of patients with HIV infection, in many cases providing primary care in collaboration with an HIV expert. Generalists also play a critical role in the diagnosis and prevention of HIV infection. Generalists managing HIV-infected patients should be aware of the components of the initial patient evaluation. They should be familiar with the general principles of antiretroviral therapy and opportunistic infection prevention. They should be able to recognize antiretroviral toxicity and should be aware of common drug-drug interactions involving antiretroviral agents.

Key Words: HIV, Antiretroviral therapy, Primary care, Expertise

There is broad consensus that HIV-infected patients should be managed under the direction of an HIV expert. Expert care is associated with reduced morbidity, mortality, and cost of care,[1-8] reflecting the complexity of HIV infection and its treatment. However, the model of care that was popular in the early years of the acquired immune deficiency syndrome (AIDS) epidemic, in which experts provided comprehensive primary and specialty care to HIV-infected patients, may no longer be viable in all settings. Although the number of HIV-infected patients increases, the number of HIV experts appears to be shrinking. As a result of the effectiveness of antiretroviral therapy (ART) and the aging of the HIV-infected population, HIV disease is often low on the list of medical priorities for many patients. Some HIV experts, many of whom are trained in infectious diseases, may be neither inclined nor qualified to provide primary care for an aging population. As more infected patients become "mainstreamed" into general medical practices, generalists will need to have a basic understanding of the management of HIV-positive patients.

The generalist who provides primary care problems, the patient may be seen regularly by the generalist, the expert, and possibly other subspecialists, with care coordinated by the generalist. HIV-infected patients who live in small towns or rural communities may not have easy access to an HIV expert. However, care can still be guided by an expert with infrequent visits (in person or by telemedicine) and regular communication between the generalist and the expert by e-mail, telephone, or fax.

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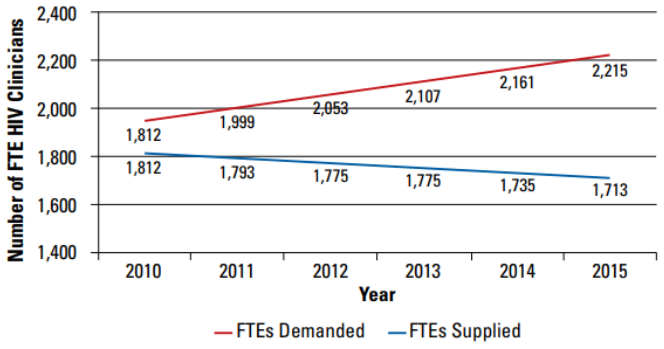


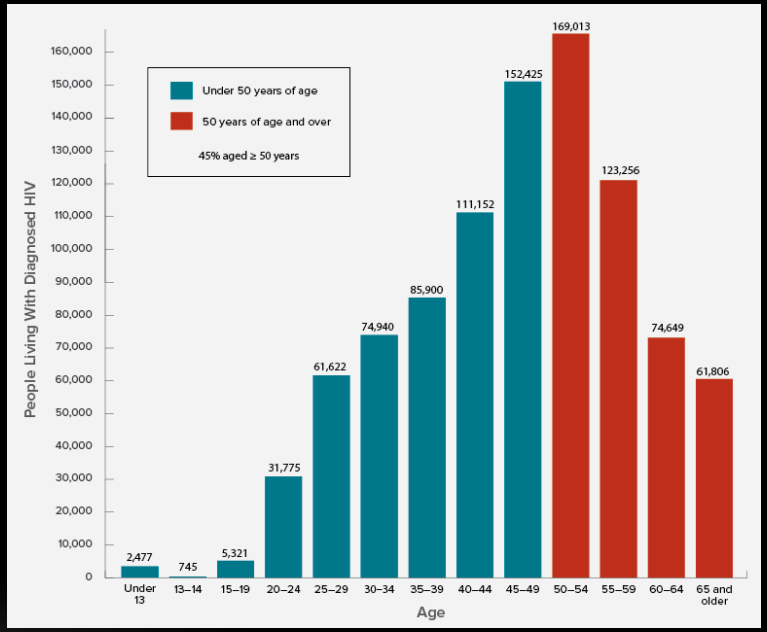
FTE = full-time equivalent.

Sources: HIV Clinician Workforce Survey 2012, NAMCS (2009), NHAMCS (2008), HCUP-NIS (2002–2009), and federal and state HIV surveillance data (2008).

HIV is a chronic disease

- Associated with ↑ risk for many cancers; currently, recommended screening for PLWH is essentially the same as for general population (exception: anogenital cancer screening)

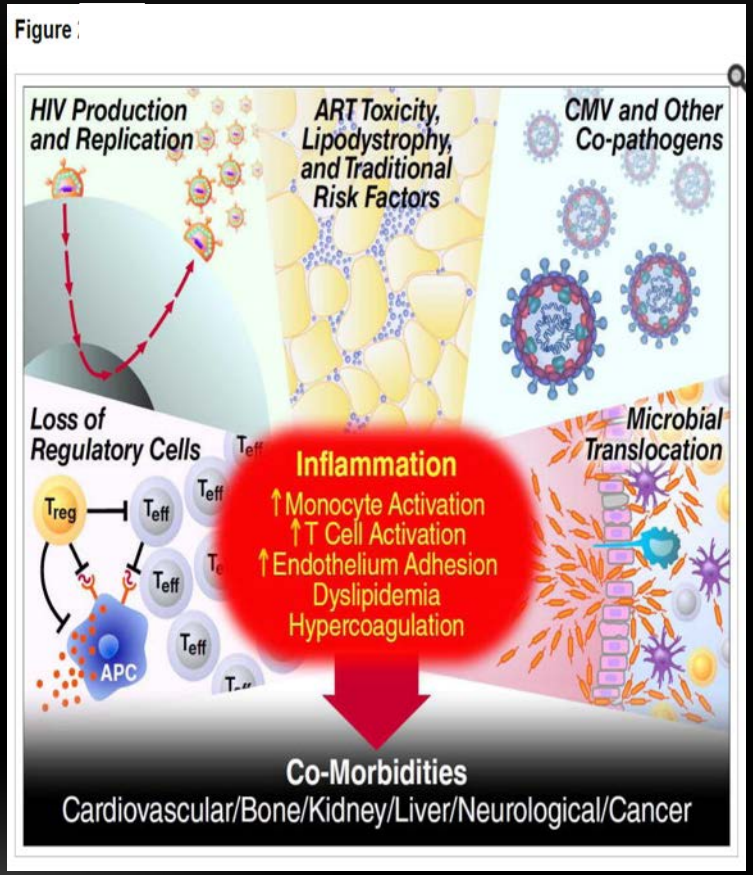
- PLWH benefit from counseling on the same issues we talk about with our HIV-negative patients!
  - Tobacco
  - Healthy eating, weight loss
  - Dental care
  - Mental/emotional health,
  - Sexual health, reproductive options/family planning



- Rates of chronic co-morbidities increasing for PLWH due to many factors (long-term ART use, lifestyle and risk behaviors)

HIV AND THE CARDIOVASCULAR SYSTEM

- Higher rates (~1.5-2x ↑ risk) of myocardial infarction, atherosclerosis, sudden death, stroke
  - Partly driven by ↑ risk factors: smoking, HTN, HLD, DM
  - Multiple, direct HIV-specific mechanisms (see Figure)
  - ? HIV as CVD equivalent (strength of association similar to DM in some studies)



Early ART may slightly mitigate CVD risk increase, *but ↑ risk remains even with viral suppression!*

Reprinted from Lancet, 382 (9903), Deeks SG, Lewin SR, Havlir DV, The End of AIDS: HIV Infection as a Chronic Disease, 1525-1533, Copyright (2013), with permission from Elsevier.

HIV AND CARDIOVASCULAR DISEASE

- Diagnosis and evaluation essentially the same as for general population
- Management also largely the same
  - Primary prevention: aggressive risk factor/lifestyle modification; ACC/AHA calculator for risk assessment and dyslipidemia management* (CAUTION: DRUG INTERACTIONS WITH ART)
    - Ongoing trial investigating daily statin for primary prevention
  - Secondary prevention (DRUG INTERACTION POTENTIAL WITH ART!)
    - Statins - protease inhibitors (PIs), cobicistat
    - Clopidogrel, warfarin, NOACs - PIs, cobicistat
    - Calcium channel blockers - PIs, cobicistat
    - Metformin - dolutegravir

* Framingham, ACC/AHA calculators may underestimate risk??

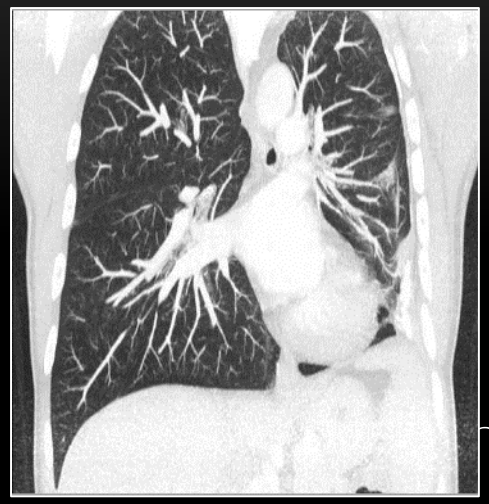
DRUG–DRUG INTERACTIONS WITH FIRST-LINE ART AND LIPID-LOWERING THERAPY

Antiretroviral	Contraindicated	Titrate Dose	No Dose Adjustment
EFV		Atorvastatin Simvastatin Pravastatin	Pitavastatin Rosuvastatin
RPV			Atorvastatin Pitavastatin
ATV/RTV	Lovastatin Simvastatin	Atorvastatin Pravastatin Rosuvastatin	Pitavastatin
ATV/COBI	Atorvastatin Lovastatin Simvastatin	Pravastatin Rosuvastatin	Pitavastatin
DRV/RTV DRV/COBI	Lovastatin Simvastatin	Atorvastatin Pravastatin Rosuvastatin	Pitavastatin
EVG/COBI/FTC/**TAF**	Lovastatin Simvastatin	Atorvastatin Rosuvastatin	
EVG/COBI/FTC/**TDF**	Lovastatin Simvastatin	Atorvastatin Rosuvastatin	
DTG or RAL			All

Slide credit: clinicaloptions.com

HIV AND PULMONARY DISEASE

COPD, lung cancer more common, largely due to ↑ rates of smoking



Evaluation and management similar as general population: PFTs indicated chronic symptoms (also to monitor if known disease). Consider imaging if for focal/infectious/malignant process.

Smoking cessation = single most important intervention to ↓ COPD/lung cancer risk for PLWH!
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Smoking cessation = single most important intervention to ↓ COPD/lung cancer risk for PLWH!

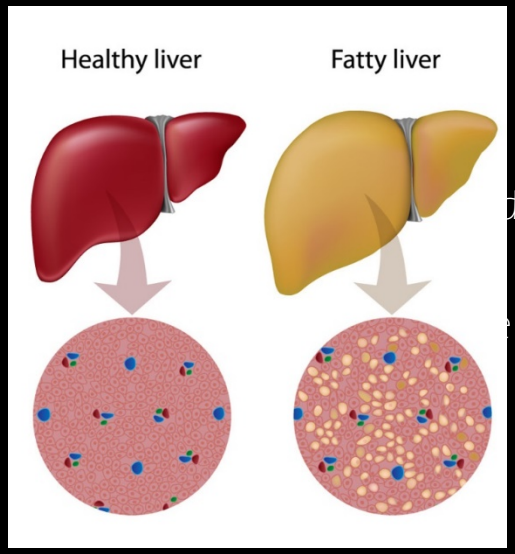
<u>Other key measures</u>: pneumococcal, influenza vaccinations to prevent complications of these infections

HIV AND NAFLD: TREATMENT APPROACHES

No *currently approved* pharmacologic interventions specific to HIV-associated NAFLD (at least two ongoing clinical trials)

Lifestyle, risk factor modification are cornerstones of management

- Dietary modification, weight loss: safe!
- Treat CVD risk factors, including metabolism, hyperlipidemia
- Avoid alcohol and other hepatotoxins
- At-risk patients should be offered vaccination



HIV-specific interventions: viral load suppression, avoid ART that can cause hepatic steatosis (i.e. zidovudine, stavudine, didanosine)

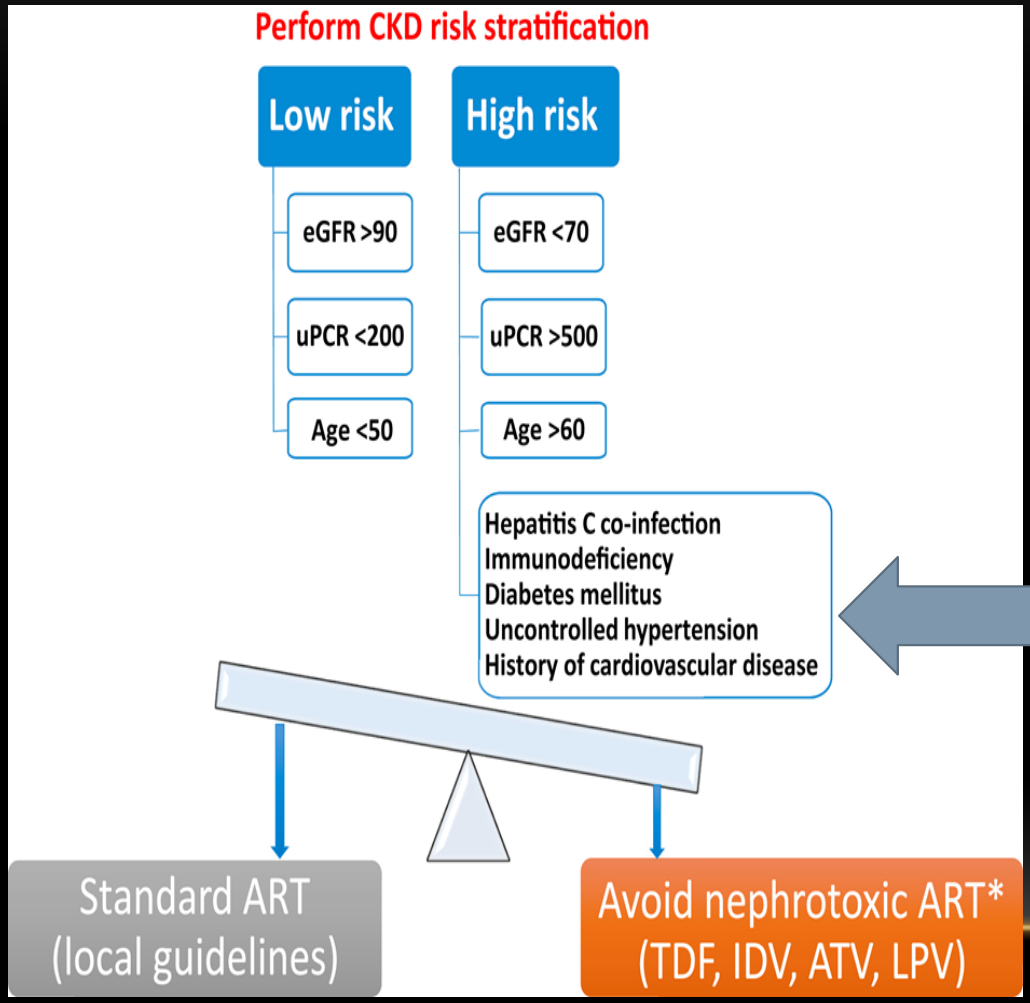
HCV CARE FOR PLWH

- HCV direct-acting antivirals (DAAs) have > 90% sustained viral response ("cure") rates, even among patients with HIV-HCV co-infection

- ALL co-infected patients should be evaluated and strongly considered for treatment; be aware of drug-drug interactions between DAAs and ART
  - For patients who cannot receive HCV treatment, ART should be initiated early and/or maintained to suppress HIV viremia and slow fibrosis development/progression
  - Patients should be screened and treated for alcohol use, obesity, dyslipidemia, diabetes

- At-risk patients should be offered hepatitis A, B vaccinations

ART MANAGEMENT: CKD RISK STRATIFICATION?



* if suitable alternatives available; eGFR in mL/min/1.73mm^2; uPCR in mg/g

Figure from: Swanepoel CR, Atta MG, D'Agati VD, et al. Kidney disease in the setting of HIV infection: conclusions from a Kidney Disease: Improving Global Outcomes (KDIGO) Controversies Conference. Kidney Int. 2018 Mar; 93(3): 545-559. doi:10.1016/j.kint.2017.11.007. Epub 2018 Feb 3.

TENOFOVIR ALAFENAMIDE (TAF)

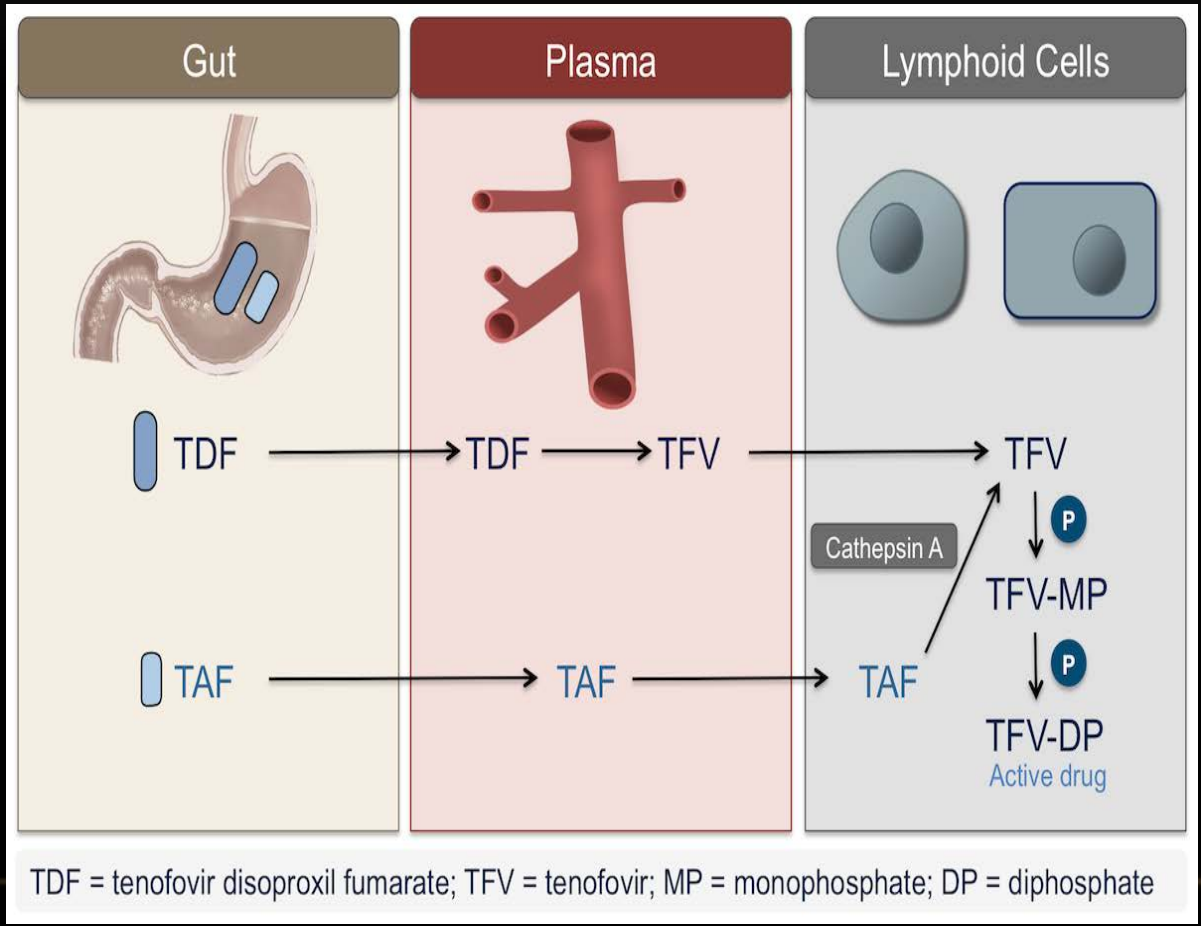
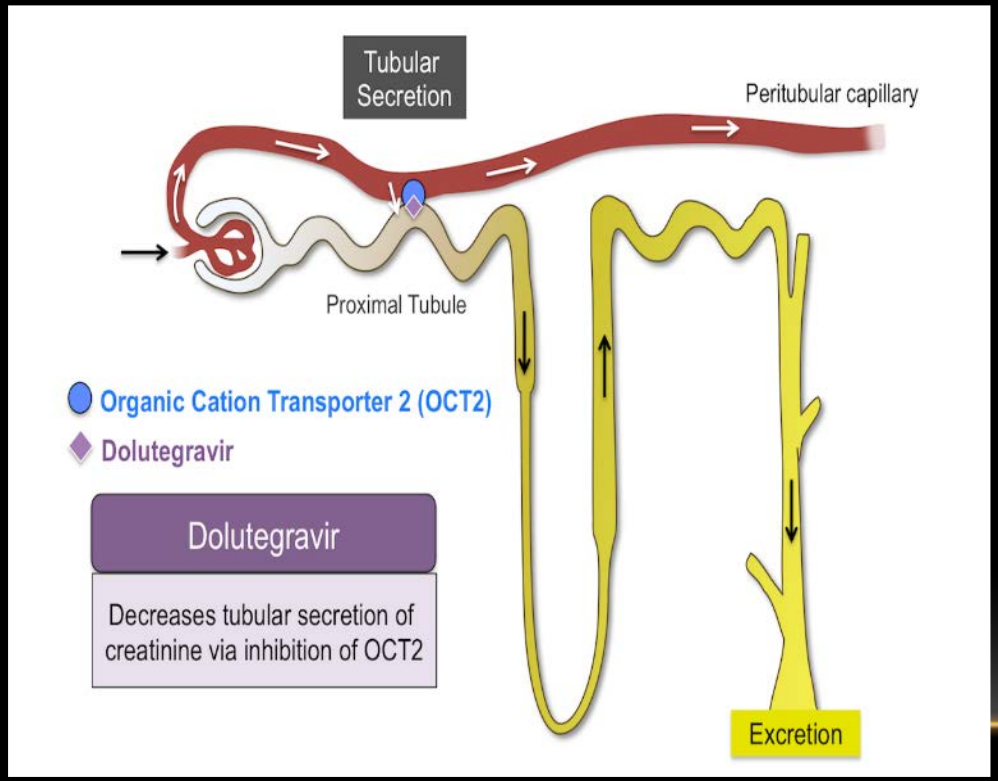


Figure used with permission, from National HIV Curriculum

SOME ART MEDICATIONS CAN AFFECT SERUM CREATININE….
…. IT'S NOT 'TRUE' RENAL FUNCTION DECLINE!



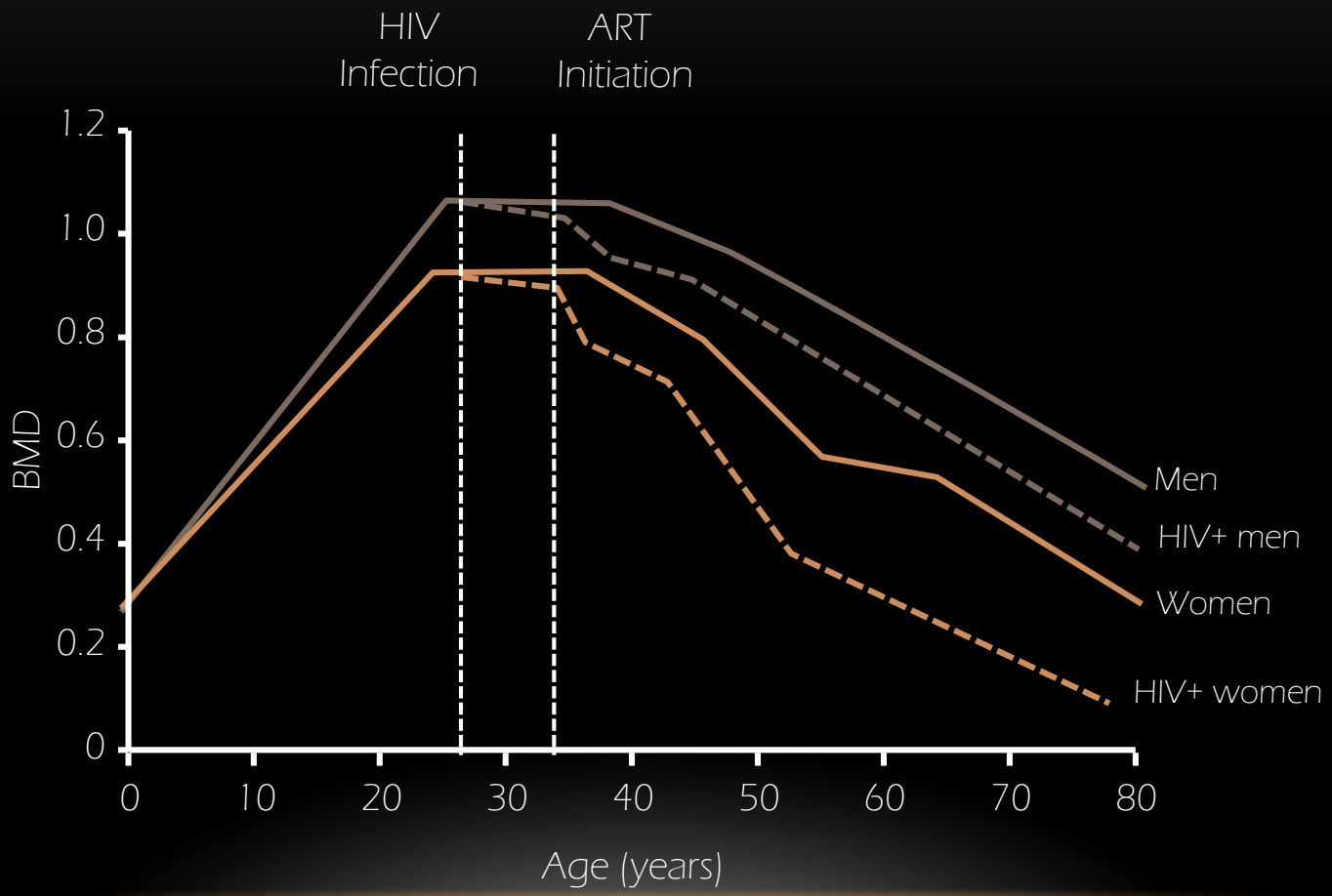
Serum creatinine increases are typically ~0.1-0.2 mg/dL, and occur within 4 weeks → stable thereafter

If serum creatinine continues to increase after 2-3 months OR increases >>> 0.2 mg/dL, look for other source(s)!

** Similar "artificial" ↑ serum creatinine can occur with rilpivirine (also via OCT2), cobicistat (via MATE1 transporter)*

Figure used with permission, from National HIV Curriculum

HYPOTHETICAL EVOLUTION OF BONE MASS IN HIV



Orwoll ES, et al. Endocrinol Rev. 1995;16:87-116.
Arpadi S, et al. J AIDS Clin Res. 2008;16:117-121.

Slide credit: clinicaloptions.com

OTHER DISEASE PREVENTION: VACCINATIONS!

General tips:

Response greatest if higher CD4 (> 500 cells/mm^3) and on ART

Live vaccines contraindicated if low CD4 (< 200 cells/mm^3)

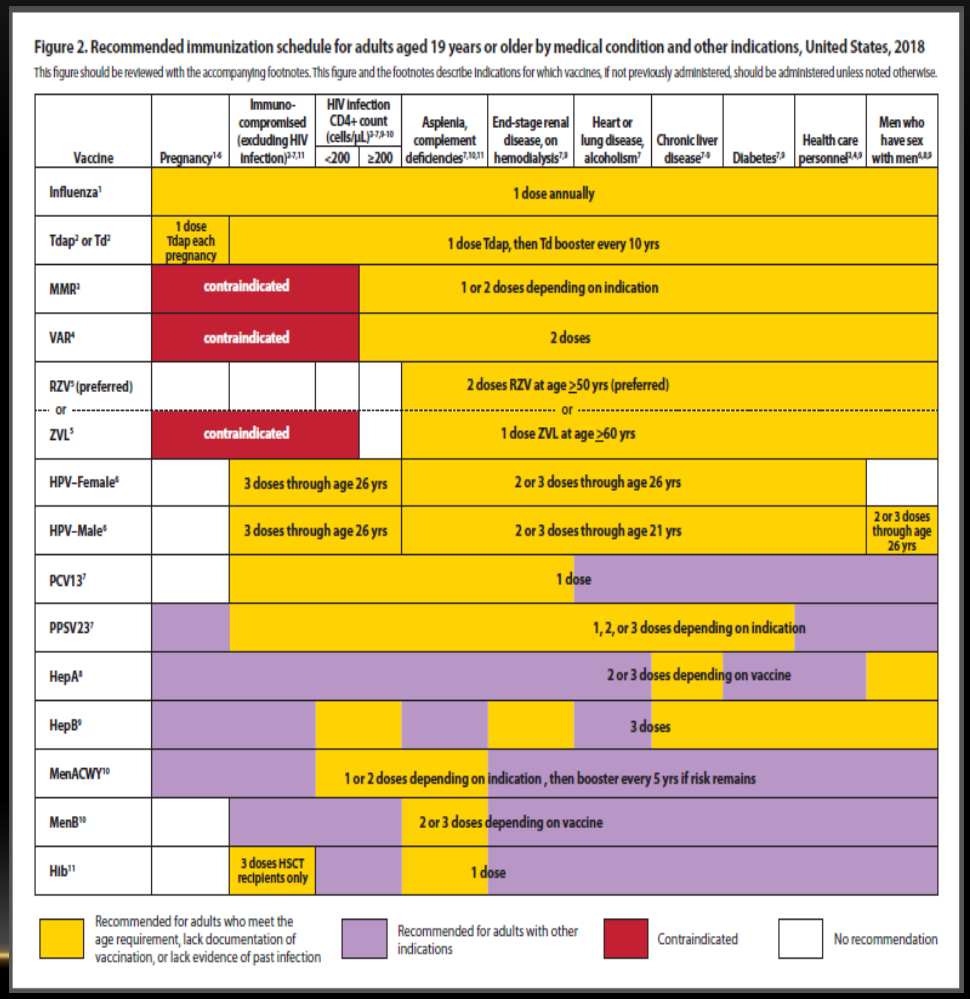


Figure 2. Recommended immunization schedule for adults aged 19 years or older by medical condition and other indications, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.

Vaccine	Pregnancy[1,6]	Immuno-compromised (excluding HIV infection)[2,7,11]	HIV infection CD4+ count (cells/μL)[2,7,9,10] <200	HIV infection CD4+ count (cells/μL)[2,7,9,10] ≥200	Asplenia, complement deficiencies[7,10,11]	End-stage renal disease, on hemodialysis[7,9]	Heart or lung disease, alcoholism[7]	Chronic liver disease[7,9]	Diabetes[7,9]	Health care personnel[3,4,9]	Men who have sex with men[6,8,9]
Influenza[1]	1 dose annually										
Tdap[2] or Td[2]	1 dose Tdap each pregnancy	1 dose Tdap, then Td booster every 10 yrs									
MMR[3]	contraindicated	1 or 2 doses depending on indication									
VAR[4]	contraindicated	2 doses									
RZV[5] (preferred)					2 doses RZV at age ≥50 yrs (preferred)						
or					or						
ZVL[5]	contraindicated				1 dose ZVL at age ≥60 yrs						
HPV–Female[6]		3 doses through age 26 yrs			2 or 3 doses through age 26 yrs						
HPV–Male[6]		3 doses through age 26 yrs			2 or 3 doses through age 21 yrs						2 or 3 doses through age 26 yrs
PCV13[7]		1 dose									
PPSV23[7]		1, 2, or 3 doses depending on indication									
HepA[8]	2 or 3 doses depending on vaccine										
HepB[9]	3 doses										
MenACWY[10]	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains										
MenB[10]	2 or 3 doses depending on vaccine										
Hib[11]	3 doses HSCT recipients only				1 dose						

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

Contraindicated

No recommendation

Recommended Immunization Schedule for Adults Aged 19 Years or Older by Medical Conditions and Other Indications, United States, 2018 (ACIP)

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- Primary care and HIV
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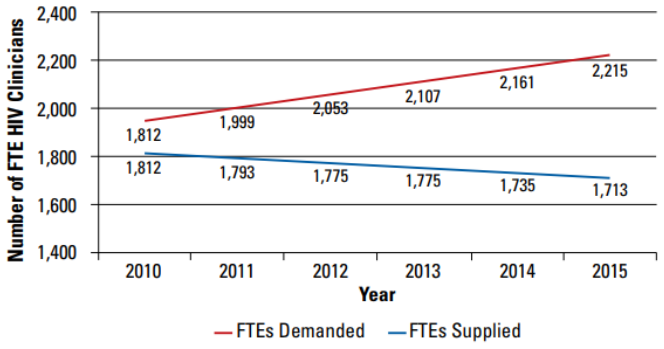

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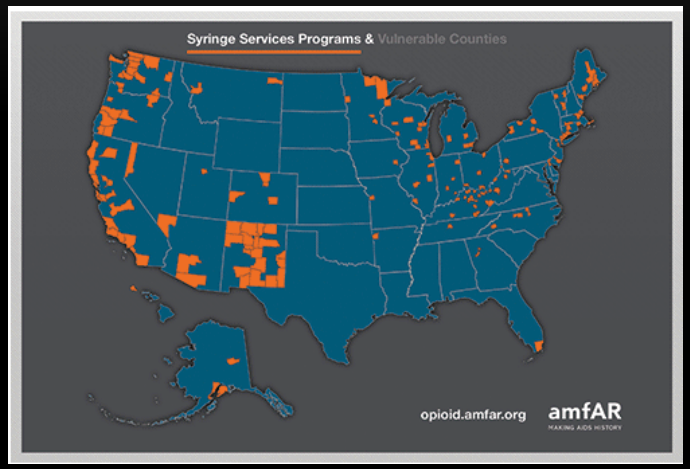
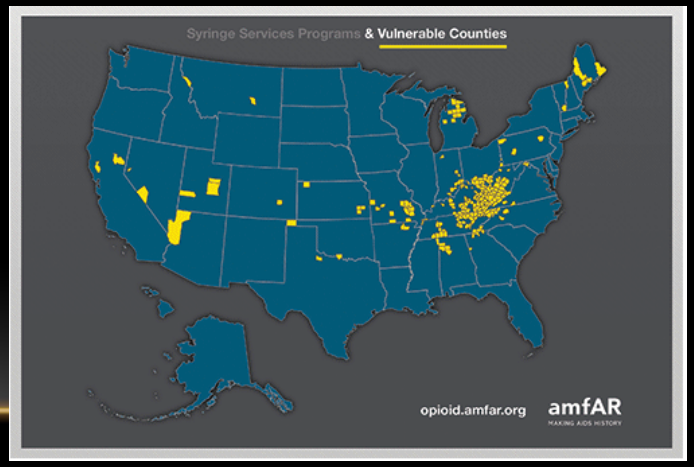
KEY CHALLENGES IN PREVENTING HIV/HCV OUTBREAKS IN RURAL AREAS

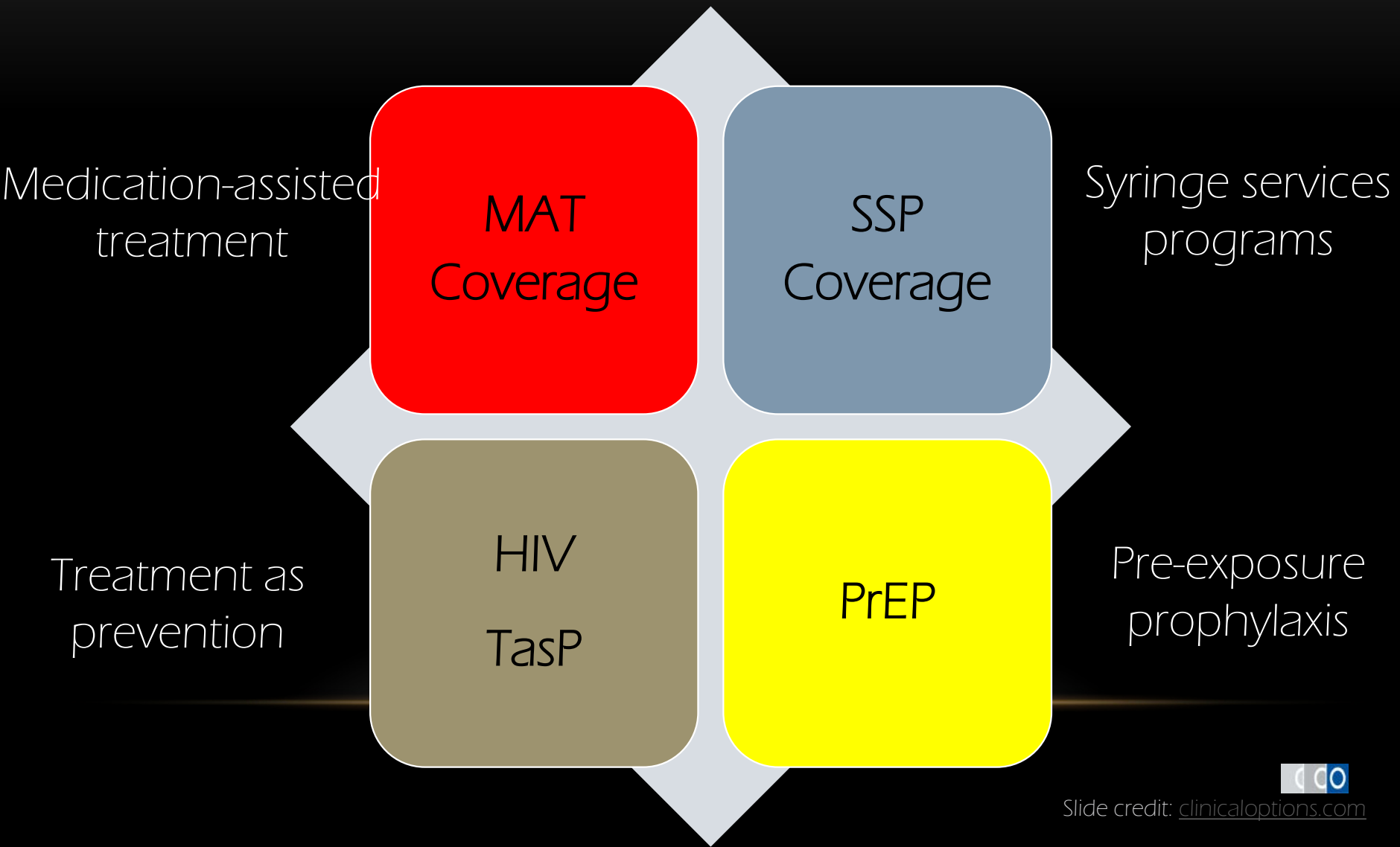
1. Limited access to services
   - Long distances
   - Few transportation options
   - Uninsured (no or limited ACA expansion)
2. Distrust between PWID and law and community leaders
3. Limited or restricted infrastructure
   - HIV and viral hepatitis testing
   - Clinical HIV/HCV care services
   - Medication-assisted therapy
   - Syringe service programs





Slide credit: clinicaloptions.com

COMPREHENSIVE STRATEGIES TO PREVENT HIV TRANSMISSION



Slide credit: clinicaloptions.com

IMPACT OF OPIOID AGONIST THERAPIES (OAT) ON HIV TREATMENT OUTCOMES

- OAT improves many non-HIV-specific outcomes[1,2]:
  - ↓ Opioid use
  - ↑ Physical and mental health quality of life
  - ↓ Incarceration
  - ↓ Emergency department use
  - ↑ Employment
  - ↑ Management of comorbid conditions
- For people living with HIV, OAT improves[3]:
  - Access to and retention in HIV care
  - ART prescription (+54%)
  - ART adherence (+2-fold), also decreases ART discontinuation (-23%)
  - Viral suppression (+45%)

1. Mattick RP, et al. The Cochrane Library. Update Software; 2003. 2. Mattick RP, et al. The Cochrane Library. Update Software; 2004. 3. Low AJ, et al. Clin Infect Dis. 2016;63:1094-1104.

Slide credit: clinicaloptions.com

Thank you!

To learn more, please visit: nccc.ucsf.edu.

Questions/marketing materials? Email Carolyn.Chu@ucsf.edu

Substance Use Warmline 855-300-3595
Substance use evaluation and management

HEPline 844-HEP-INFO
HCV testing, staging, monitoring, treatment

HIV/AIDS Warmline 800-933-3413
HIV testing, ARV decisions, complications, and co-morbidities

PrEPline 855-HIV-PrEP
Pre-exposure prophylaxis for persons at risk for HIV

Perinatal HIV Hotline 888-448-8765
Pregnant women with HIV or at-risk for HIV & their infants

PEPline 888-448-4911
Occupational & non-occupational exposure management