

# Primer on Sexual Health: An Infectious Diseases Perspective

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# Learning Objectives

- Status of the US STI epidemic
- Taking sexual history in a gender diverse population
- Discuss screening guidelines for common STIs
- Review approach to management of common STIs and syndromes
  - Ulcers - syphilis, HSV
  - Urethritis- chlamydia, gonorrhea, trichomonas
  - Epididymitis, proctitis, PID
  - HPV, vaccine preventable STI
- Know how to prescribe PrEP

# STIs in the US: Scope and Impact

- US has the highest rates of all industrialized nations. Tremendous health and economic consequences.
- Half of all STIs occur among youth, 15 to 24 years. Facilitate HIV transmission and cause PID/ infertility, chronic pelvic pain, poor birth outcomes.
- Scope and impact remain under recognized by the public and healthcare professionals. Insufficient priority and focus.
- **Affect hidden fragile populations** and stigmatize entire subgroups.
- Public health programs are increasingly challenged with barriers.

# STI National Strategic Plan for the US, 2021-2025

- First-of-its-kind, five-year plan released by the U.S. government to curb the rising rate of STIs by coordinating efforts among public health, health care, government, community organizations, and other stakeholders.
- Roadmap with a vision, goals, objectives, and strategies, including measurable targets, while addressing the disproportionate impact on priority populations and seeking to eliminate stigma.

# STI PLAN: Vision and Goals

## A. Vision

The United States will be a place where sexually transmitted infections are prevented and where every person has high-quality STI prevention, care, and treatment while living free from stigma and discrimination.

This vision includes all people, regardless of age, sex, gender identity, sexual orientation, race, ethnicity, religion, disability, geographic location, or socioeconomic circumstance.

## B. Goals

In pursuit of this vision, the STI Plan establishes five goals:



**1. Prevent new STIs**



**2. Improve the health of people by reducing adverse outcomes of STIs**



**3. Accelerate progress in STI research, technology, and innovation**



**4. Reduce STI-related health disparities and health inequities**

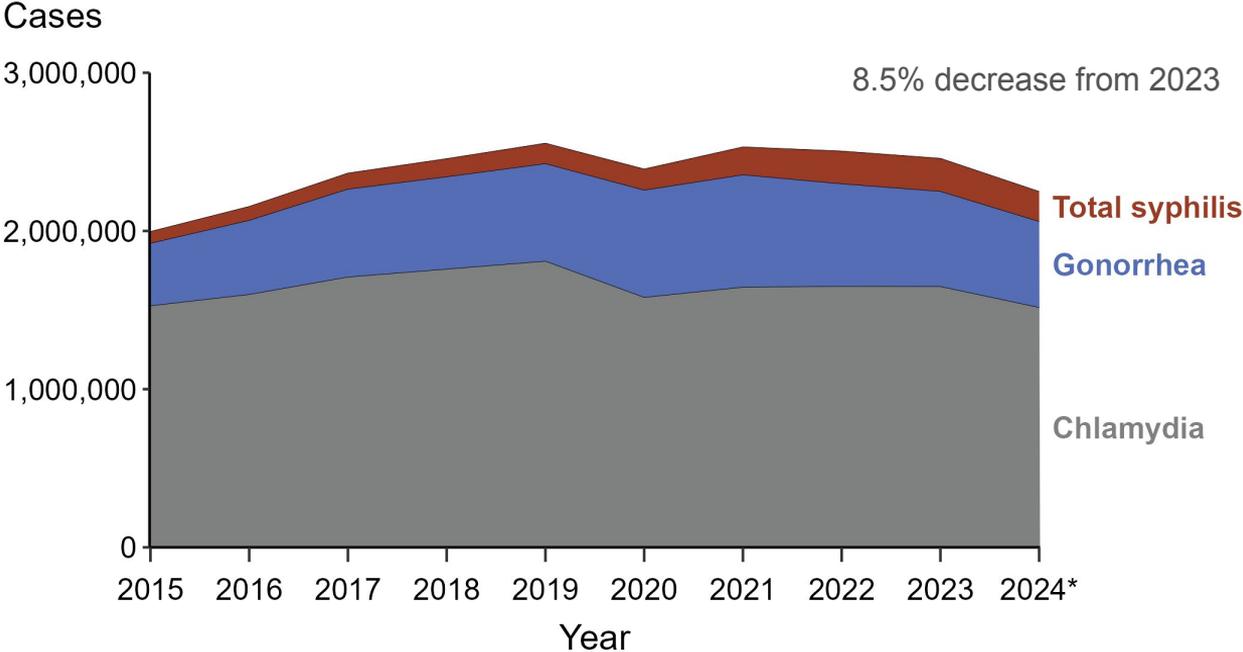


**5. Achieve integrated, coordinated efforts that address the STI epidemic**

# Scope

- Highlights four STIs (besides HIV) with the greatest impact on the health of the nation: **chlamydia, gonorrhea, syphilis, and HPV**.
- Recognized “**priority populations**” most impacted by STIs: adolescents and young adults, men who have sex with men (MSM) and pregnant women.
- Recognized racial and ethnic minority communities (Black, American Indian/Alaska Native, and Hispanic) and geographic regions (Southern and Western regions of the US) most impacted by STIs.

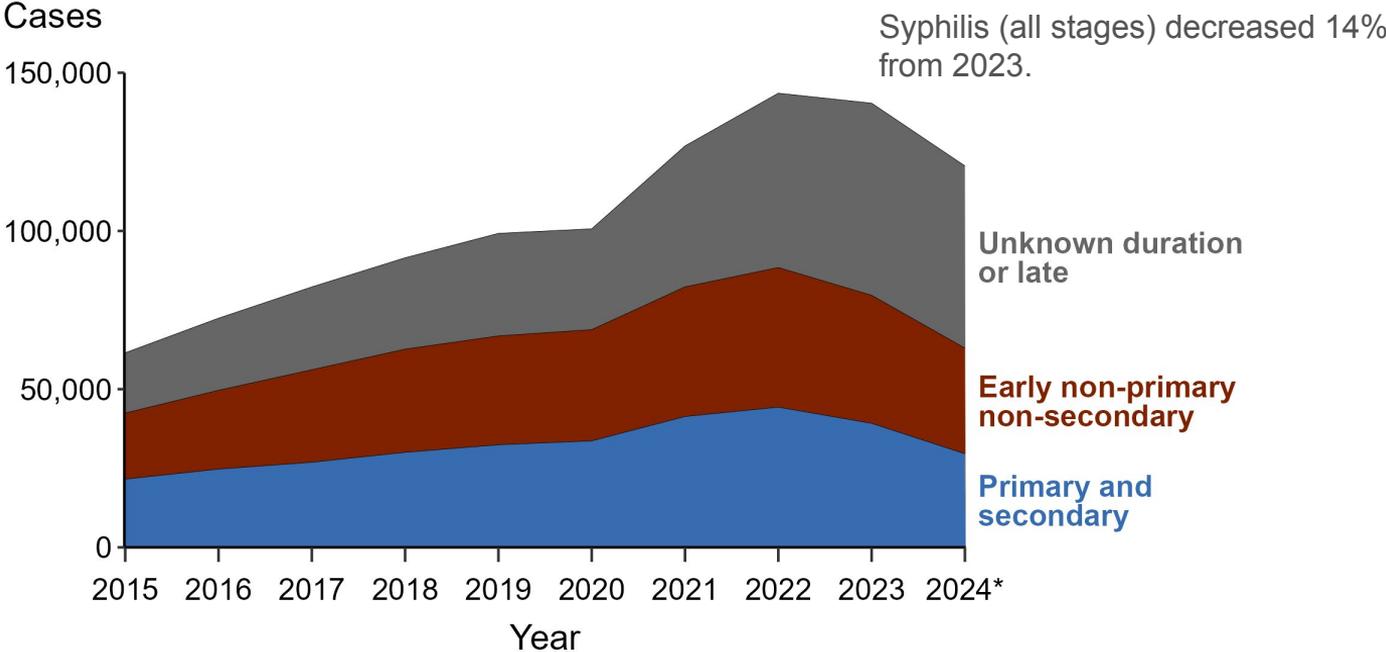
# Reported Cases by STI and Year, US, 2015–2024



\* 2024 data are provisional as of August 14, 2025.

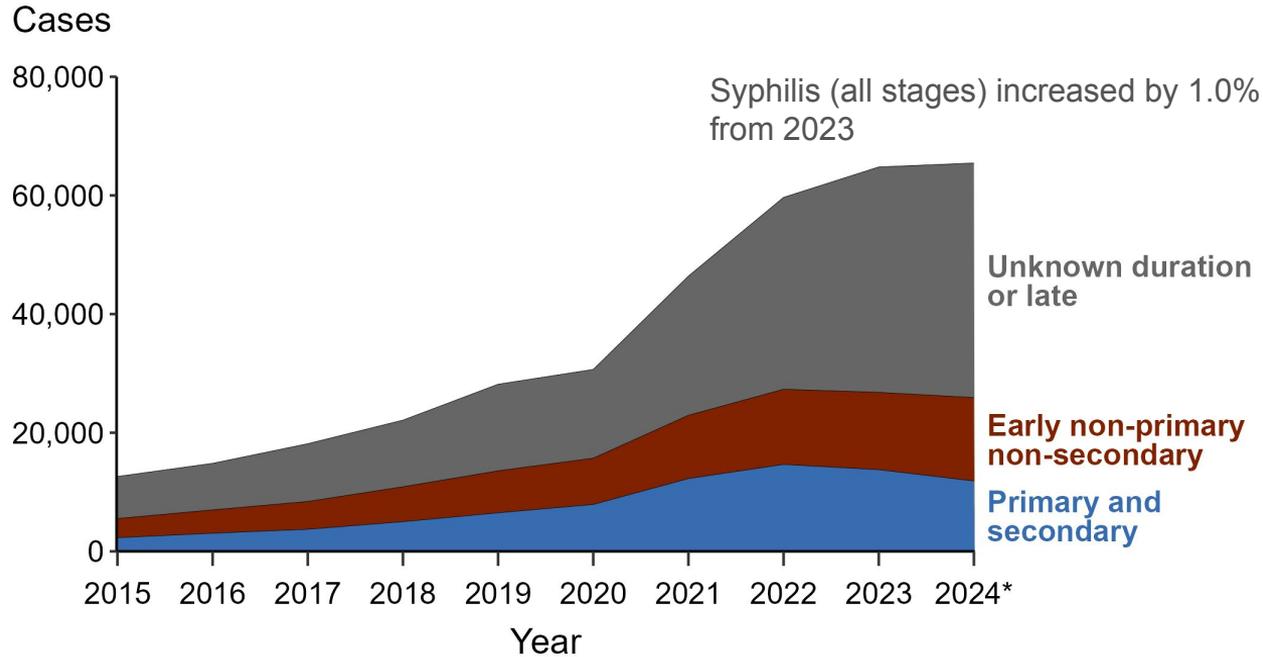
**NOTE:** “Total syphilis” includes all stages of syphilis and congenital syphilis.

# Syphilis — Reported Cases Among Men, US, 2015–2024



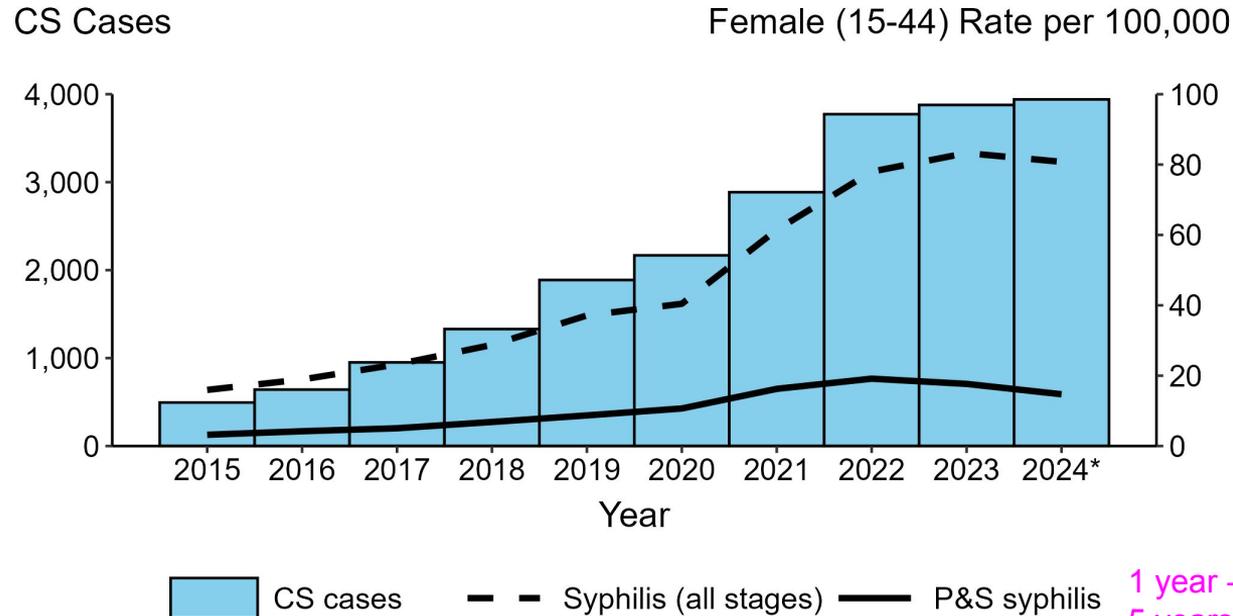
\* 2024 data are provisional as of August 14, 2025.

# Syphilis — Reported Cases Among Women, US, 2015–2024



\* 2024 data are provisional as of August 14, 2025.

# Congenital Syphilis Cases and Rates Among Women Aged 15–44 Years, US, 2015–2024

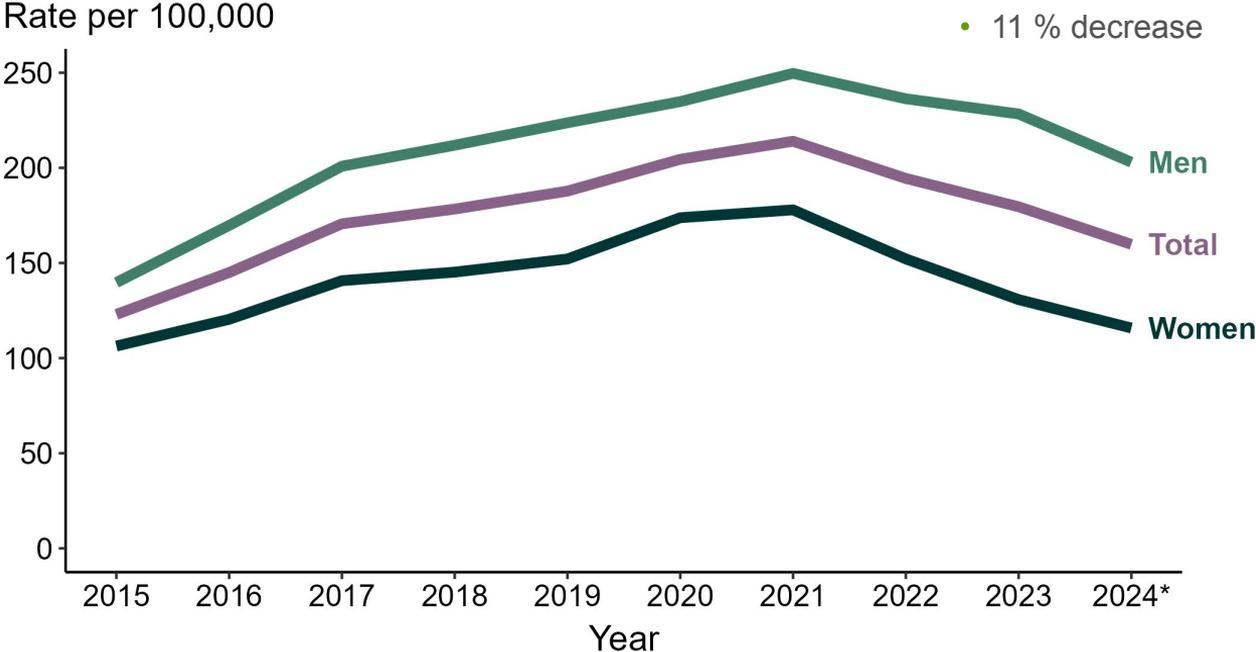


\* 2024 data are provisional as of August 14, 2025.

**ACRONYMS:** CS = Congenital syphilis; P&S Syphilis = Primary and secondary syphilis

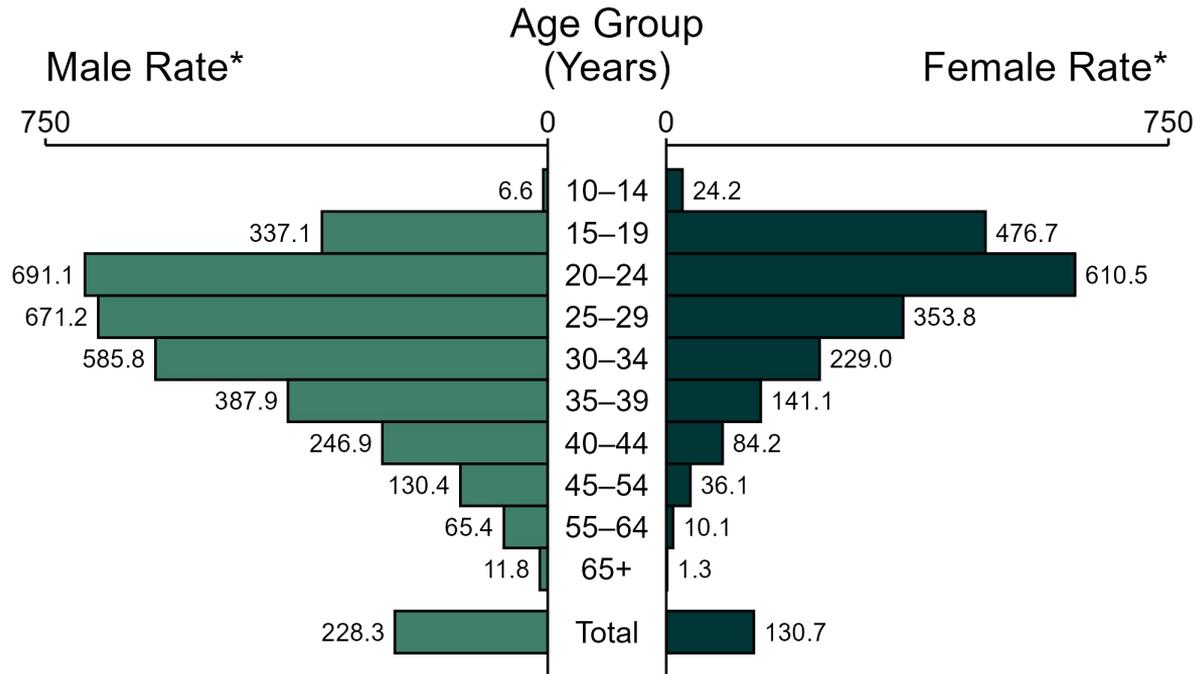
1 year - CS cases increased 1.6%  
 5 years - CS cases increased 81.8%  
 10 years - CS cases increased 696.2%

# Gonorrhea — Rates by Sex and Year, US, 2015–2024



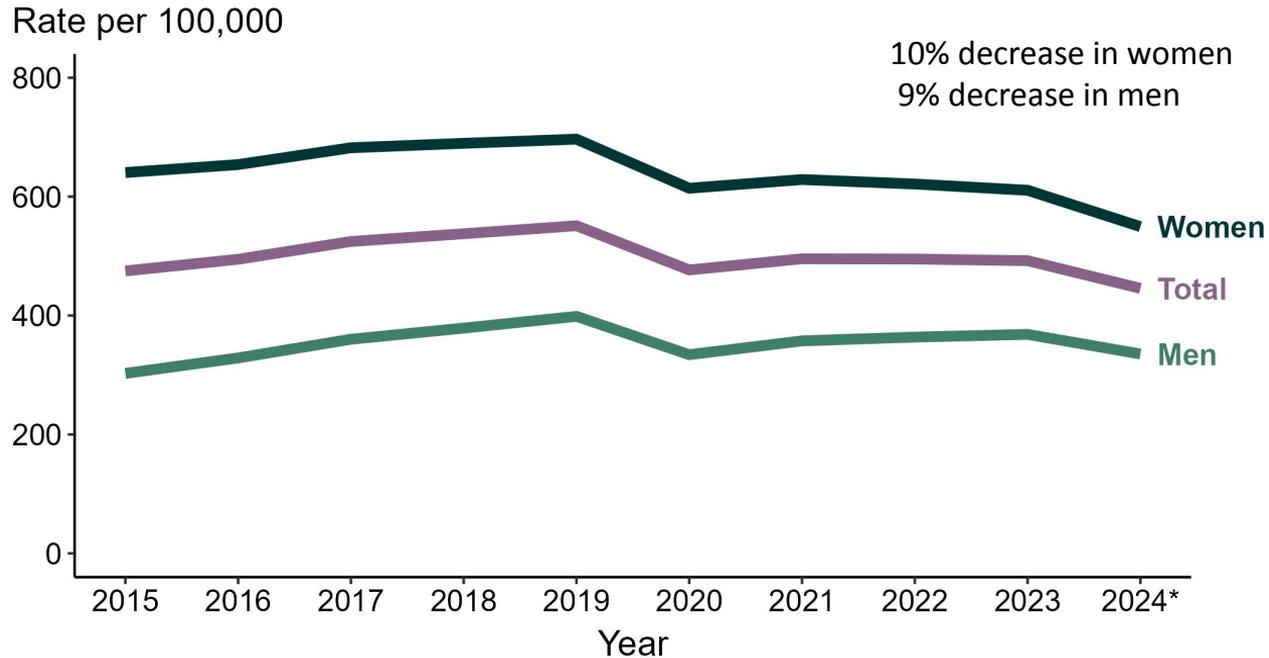
\* 2024 data are provisional as of August 14, 2025.

# Gonorrhea — Rates by Age Group and Sex, US, 2023



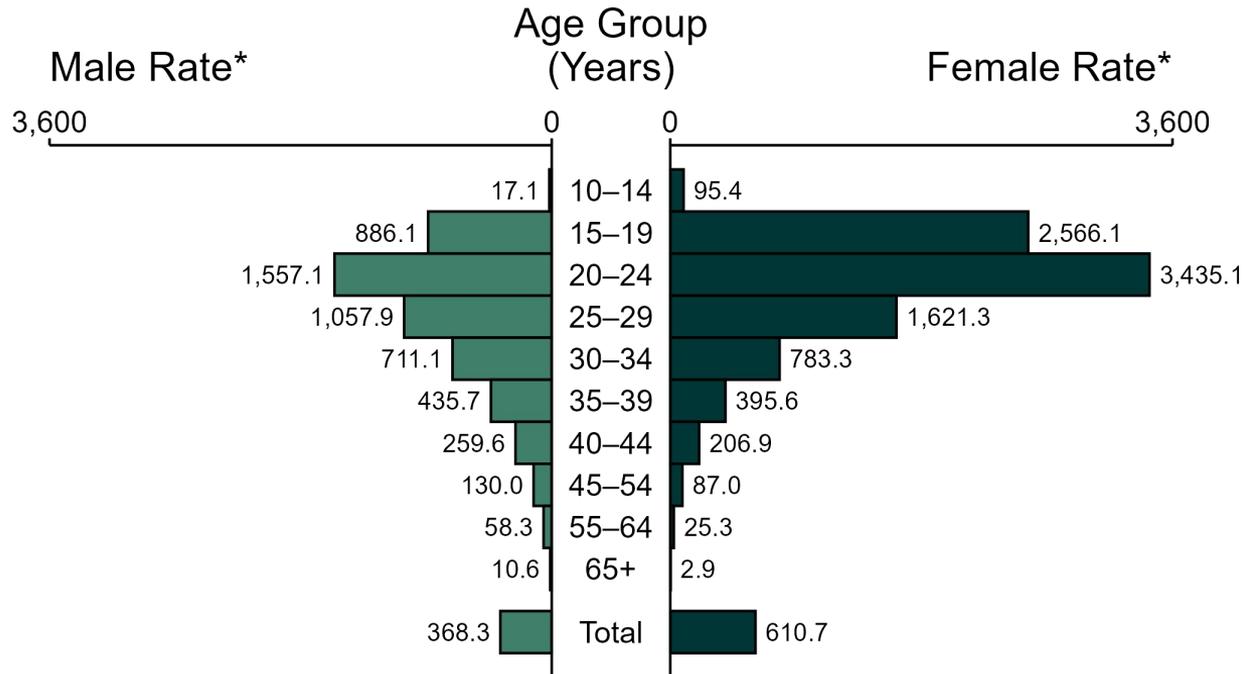
\* Per 100,000

# Chlamydia — Rates by Sex and Year, US, 2015–2024



\* 2024 data are provisional as of August 14, 2025.

# Chlamydia — Rates by Age Group and Sex, US, 2023



\* Per 100,000

# Case #1: Missed Opportunities

- 27 year old software engineer presents to the ED with pleuritic chest pain and dyspnea on exertion for 1 month.
- Cardiac w/u and CTPA done. Discharged on Doxy. Returns to ED 5 d later- continuing to feel poorly. Repeat CTPA done and admitted.
- What has been missed in the differential diagnosis?



# Case #1: Missed Opportunities

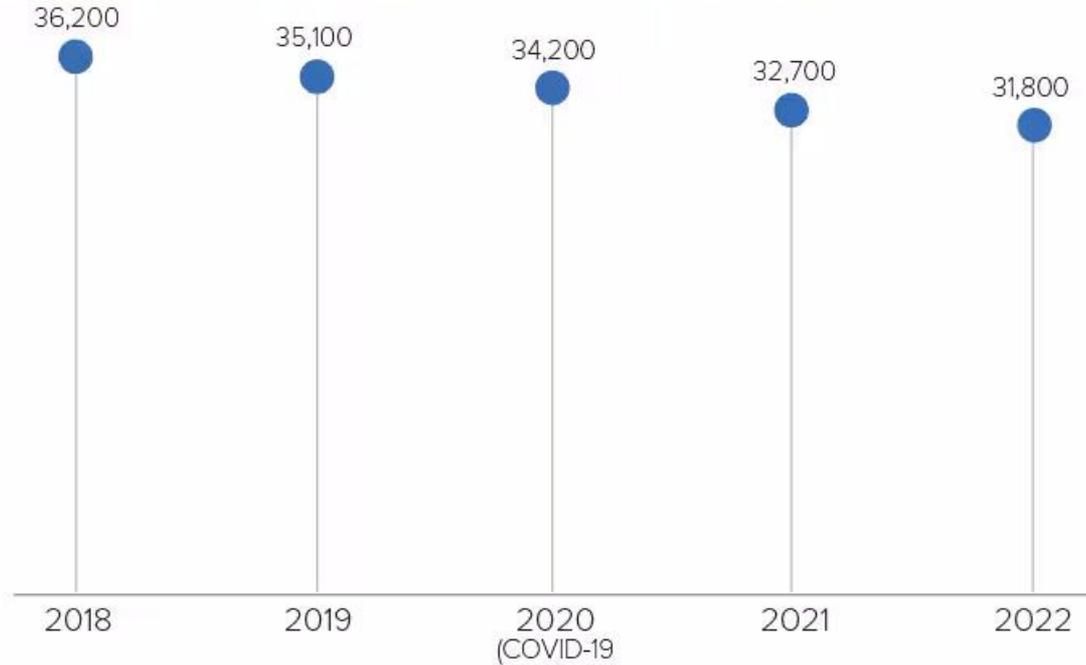
## PMH

- Aug 2022- ED visit for high fevers and sore throat. Neg COVID, Strep and Mono screen. Discharged on prednisone. Returned 2 d later. Neck CT done - shows cervical lymphadenopathy
- Oct 2022- Blood in stools x 1 month → colonoscopy done
- Aug 2023 - rectal bleed
- April 2024 - anal fissure
- Sept 2024 - perianal abscess

What test did he need at his visit in Aug 2022, subsequent visits in 2022-24?

What was missed in the differential diagnosis for his Aug 2022 presentations?

# Progress in HIV Prevention - 12% Decline from 2018 - 2022



**Overall Goal: Decrease the estimated number of new HIV infections to 9,300 by 2025 and 3,000 by 2030.**



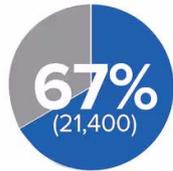
Common

Ending  
the  
HIV  
Epidemic

imankindness®

# Estimated HIV Infections by Transmission Category, 2022

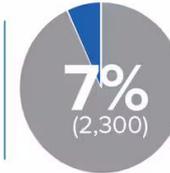
There were **31,800** estimated new HIV infections in the US in 2022. Of those:



were among gay, bisexual, and other men who reported male-to-male sexual contact\*



were among people who reported heterosexual contact



were among people who inject drugs

\* Includes infections attributed to male-to-male sexual contact *and* injection drug use (men who reported both risk factors).

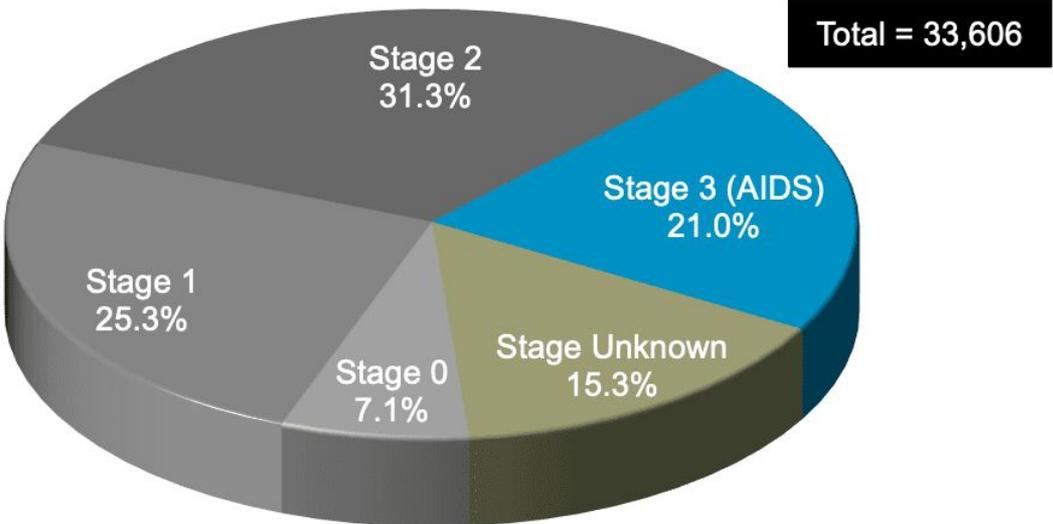
Source: CDC. Estimated HIV incidence and prevalence in the United States, 2018–2022. *HIV Surveillance Supplemental Report*, 2024; 29(1).

Ending  
the  
HIV  
Epidemic

**Overall Goal: Decrease the estimated number of new HIV infections to 9,300 by 2025 and 3,000 by 2030.**



# Stage of Disease at Time of HIV Diagnosis, 2021



# USPSTF HIV Screening Recommendations

- **Routine HIV Screening:** All adults and adolescents 15 to 65 years of age. Screening should also be performed for those < 15 and > 65, if they have increased risk for acquiring HIV (Grade A).
- **Screening for HIV in Pregnancy:** All women should be screened for HIV during each pregnancy, including those who present in labor. (Grade A).
- **Screening Intervals:** Repeat screening for those (1) known to be at increased risk of acquiring HIV and (2) those who live or receive medical care in a high-prevalence setting.

# Risk Groups

Associated with high STI prevalence or high morbidity

- Young age (15 to 24 years old)
- MSM
- Pregnant women
- History of prior STI
- HIV-positive status
- Admission to correctional facility
- Illicit drug use



# LGBTQ community has unique challenges

- Higher rates of anxiety, depression and stress
- Higher rates of sexual violence, substance abuse, poverty and homelessness
- Individuals may be reluctant to share sexual practices
- Individuals may have prior traumatic experiences with clinicians
  
- Promote a **comfortable and nonjudgmental environment.**
- **Do not assume** gender, gender identity, pronouns, sexual orientation of patient or their partners, or types of sexual activity in which they are engaging

# The 5 “Ps” of Sexual History

**PARTNERS**

**PRACTICES**

**PROTECTION**  
from STIs

**PAST HISTORY**  
of STIs

**PREGNANCY**  
INTENTION

- Determine the gender[s] of sex partners
- Guide risk assessment and need for testing
- Identify the appropriate level of risk-reduction counseling
- Evaluate risk factors for HIV acquisition or transmission
- Allow discussion of HIV transmission prevention

CDC. *A guide to taking a sexual history*. Published 2021. Accessed January 20, 2023. <https://www.cdc.gov/std/treatment/sexualhistory.pdf>

# STI Screening: Non-Pregnant Women

(partners of any gender)

- Women < 25 y: Chlamydia/gonorrhea **annually**
- Women 25 y and older: Chlamydia/gonorrhea if **at risk**
- All should get HIV and Hep C\* test at least once

\*unless prevalence < 0.1%

Screening for *M. genitalium* and *Trichomonas* is not recommended

# STI Screening: Pregnant Women

(partners of any gender)

## Everyone

- HIV, first prenatal visit; If at risk, retest during 3<sup>rd</sup> trimester.
- Hep C with every pregnancy
- Syphilis, first prenatal visit; If at risk, retest during 3<sup>rd</sup> trimester + delivery.
- HepB sAg, first prenatal, even if vaccinated or previously tested

## If <25 years of age or with risk:

- Chlamydia and Gonorrhea @ first prenatal plus retest in 3<sup>rd</sup> trimester

# STI Screening: MSM

- HIV\*
- Syphilis\*
- Urethral GC and CT\*; Rectal GC and CT (if receptive anal sex)\*
- Pharyngeal GC (if oral sex)\*
- Hepatitis B (HBsAg, HBV core ab, HBV surface ab)
- Hepatitis C: (At least once if  $\geq 18$  yo)
- Anal cancer: annual digital anorectal exam may be useful (no anal Pap rec yet)

*\*Annually, more frequent (3-6 months) if multiple/anonymous partners, drug use, or partners w/ risk*

# STI Screening: Transgender (TG) Persons

Based on current anatomy and gender of sex partners

- Offer HIV screening to all
- TG persons who have sex with cisgender men, at similar risk as cis-MSM

## Transgender women post vaginoplasty

- GC/CT at all sites of exposure: oral, anal, genital

Urine vs neovaginal swab - best specimen type based on tissue type used to construct neovagina.

## Transgender Men post metoidioplasty

- If vagina still present, use cervical/vaginal swab

# Ulcerative Diseases

Syphilis

HSV

# Syphilis: The Great Imitator

Rashes

Fevers

Sensorineural hearing loss

Uveitis

Hepatitis

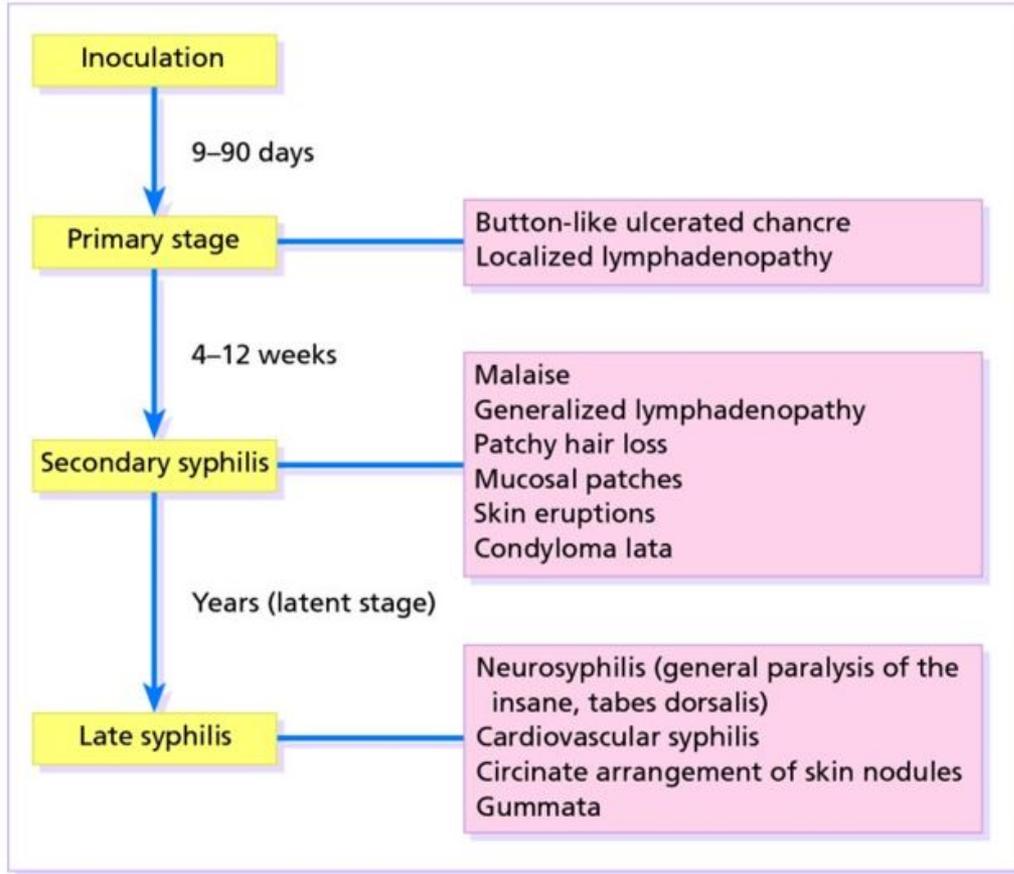
Nephritis

Meningitis

Stroke

“He who knows syphilis knows Medicine”  
– Sir William Osler

# Stages of Syphilis



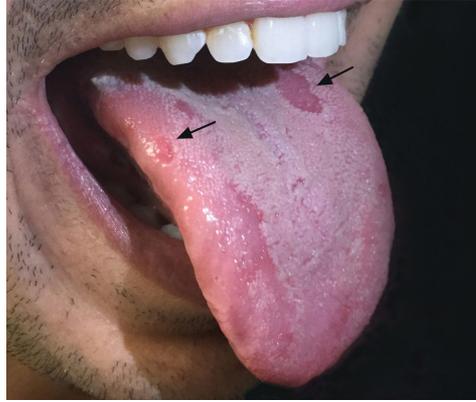
Neurosyphilis  
Ocular Syphilis  
Otosyphilis

can occur at any stage

# Syphilis: Primary Chancre



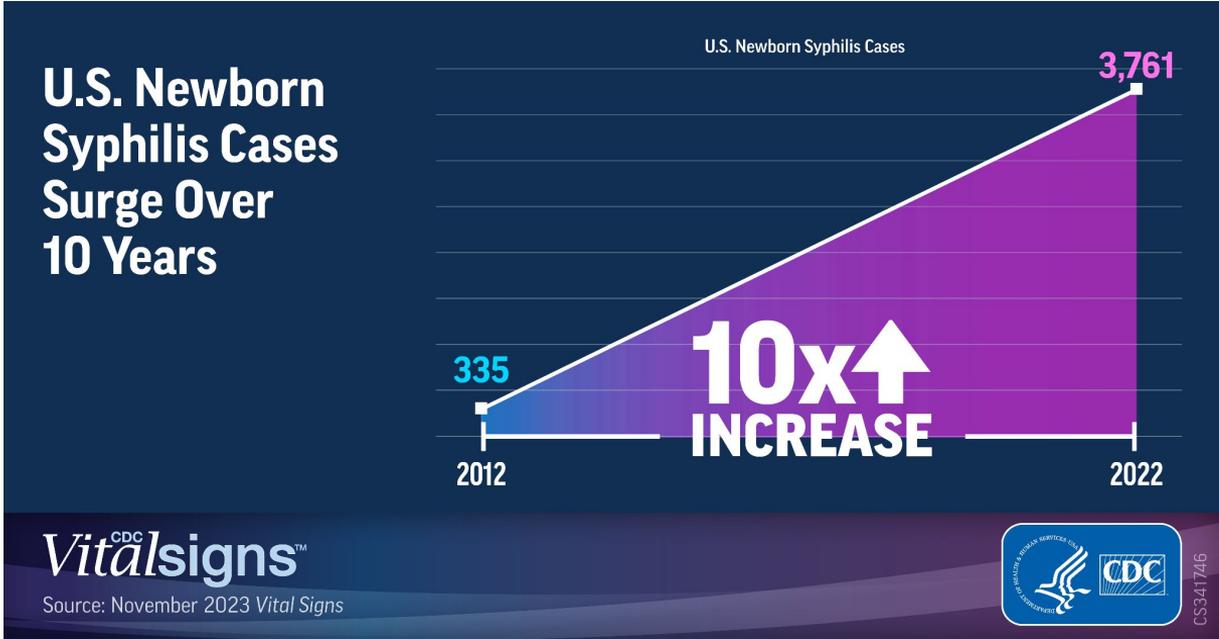
# Secondary Syphilis



# Screening for Neurosyphilis

<b>Questions</b>	
<u>Symptoms of Ootosyphilis</u> 1) Have you recently had new trouble hearing? 2) Do you have ringing in your ears?	<input type="checkbox"/> Yes – refer to ENT <input type="checkbox"/> No <input type="checkbox"/> Yes – refer to ENT <input type="checkbox"/> No
<u>Symptoms of Ocular syphilis</u> 3) Have you recently had a change in vision? 4) Do you see flashing lights? 5) Do you see spots that move or float by in your vision? 6) Have you had any blurring of your vision?	<input type="checkbox"/> Yes – refer to ophthalmology <input type="checkbox"/> No <input type="checkbox"/> Yes – refer to ophthalmology <input type="checkbox"/> No <input type="checkbox"/> Yes – refer to ophthalmology <input type="checkbox"/> No <input type="checkbox"/> Yes – refer to ophthalmology <input type="checkbox"/> No
<u>Symptoms of neurosyphilis</u> 7) Are you having headaches? 8) Have you recently been confused? 9) Has your memory recently gotten worse? 10) Do you have trouble concentrating? 11) Do you feel that your personality has recently changed? 12) Are you having a new problem walking? 13) Do you have weakness or numbness in your legs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No

# Congenital Syphilis



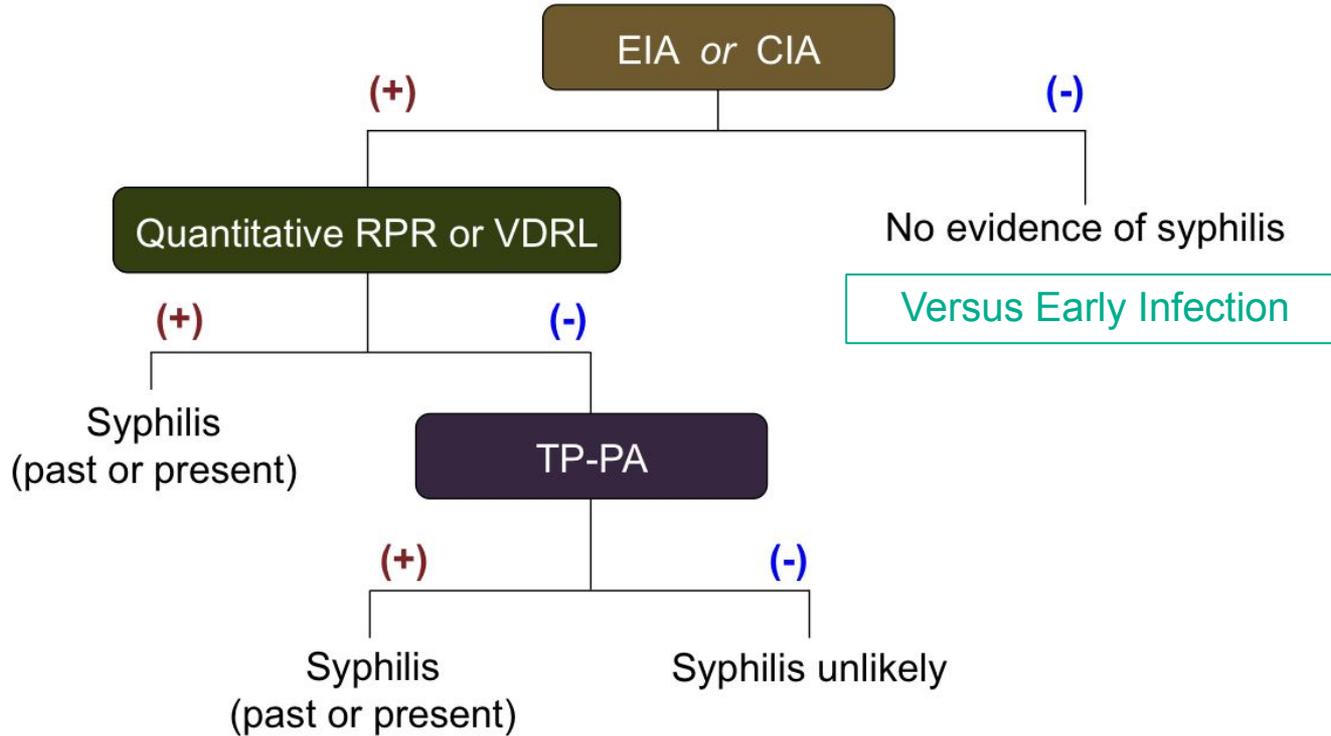
# Congenital Syphilis Crisis in the US

Almost 9 in 10 cases of newborn syphilis in 2022 might have been prevented with timely testing and treatment during pregnancy.

Over half were among people who tested positive during pregnancy but did not receive adequate or timely treatment.

Nearly 40 % were among mothers who were not in prenatal care.

# Serologic Screening



# Case #2

26 y M on daily pre-exposure prophylaxis (PrEP) returns for an evaluation and STI screen. He admits to a rash two weeks ago and blurring of vision in left eye. Syphilis EIA is POSITIVE with reflex RPR of 1:256. How would you treat him?

1. Benzathine Penicillin x 1
2. Benzathine Penicillin weekly x 3
3. Penicillin G IV daily x 14 d

# Treatment of Syphilis

## Primary, Secondary & Early Latent:

- ❖ Benzathine penicillin G 2.4 million units IM in a single dose

## Late Latent and Unknown Duration:

- ❖ Benzathine Penicillin G 7.2 million units total, given as 3 doses of 2.4 million units each at 1 week intervals

## Neurosyphilis:

- ❖ Aqueous Crystalline Penicillin G 18-24 million units IV daily administered as 3-4 million IV q 4 hr for 10 -14 d

Patients with suspected early disease based on clinical findings and negative serologic tests should be treated empirically.

# Case 3

30y pregnant F with h/o penicillin allergy presents with a painless ulcer on her vulva after unprotected vaginal sex 4 wks ago. Exam shows an ulcer with heaped up borders and a clean base. Which treatment is most appropriate?

Ceftriaxone IV

Benzathine penicillin IM

Doxycycline x 2 wks





# CLINICIAN CHECKLIST

*PROTECT MOMS = PROTECT BABIES*



Test pregnant women at first prenatal visit



Test at-risk pregnant women again at 28 weeks and at delivery



Treat women with diagnosed or suspected syphilis immediately; test and treat sex partners, too



Confirm syphilis testing at delivery



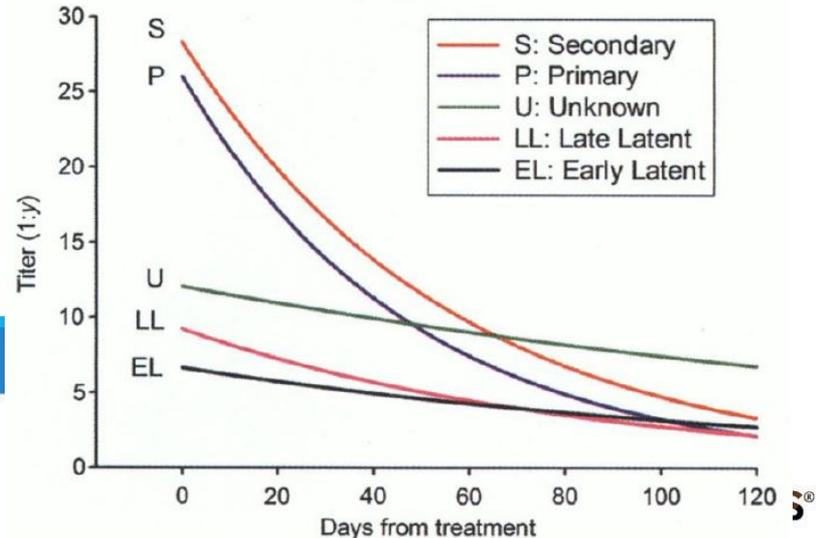
Report all syphilis & congenital syphilis cases to the health department immediately

# Clinical and Serologic F/U after Treatment

Timing of clinical and serologic follow-up after treatment of syphilis, by HIV status

	People with HIV	People without HIV
Primary and secondary syphilis	3, 6, 9, 12, and 24 months	6 and 12 months
Latent syphilis	6, 12, 18, and 24 months	6, 12, and 24 months

Workowski KA, et al. 2021 STI Treatment Guidelines. CDC. 2021.



# Syphilis: Take Home Points

- Patients with untreated syphilis remain chronically infected.
- Untreated syphilis in pregnancy can lead to stillbirth, neonatal death, and congenital syphilis.
- Among MSM, approx. one-half are coinfectd with HIV.
- Screening is recommended in all pregnant women, MSM, persons with HIV, and other high-risk groups.
- Parenteral penicillin is the preferred treatment.
- Sexual contacts within prior 90 d should receive presumptive Rx.

# Genital Herpes Simplex Virus (HSV)

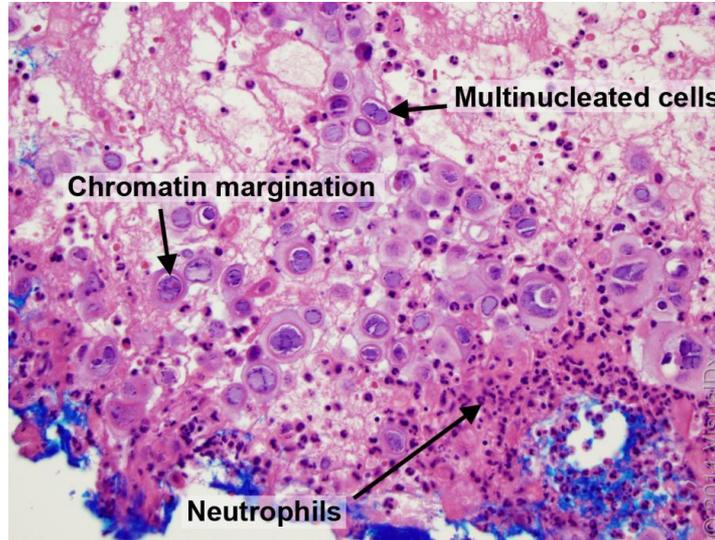
- Leading cause of genital ulcers worldwide and one of the most prevalent STIs in the US.
- Chronic infection caused by HSV-2, less commonly, HSV-1 .
- Over 85% are unaware of infection, and asymptomatic shedding accounts for majority of transmitted infections.
- Complications include meningitis, transverse myelitis, neonatal herpes, and HIV acquisition and transmission.

# Genital HSV: Clinical Presentation



# HSV: Diagnosis

- PCR-based assays are highly sensitive.
- Viral culture



# Recommended Regimens: Episodic Therapy

Initiation of therapy within 1 day of lesion onset or during the prodrome.

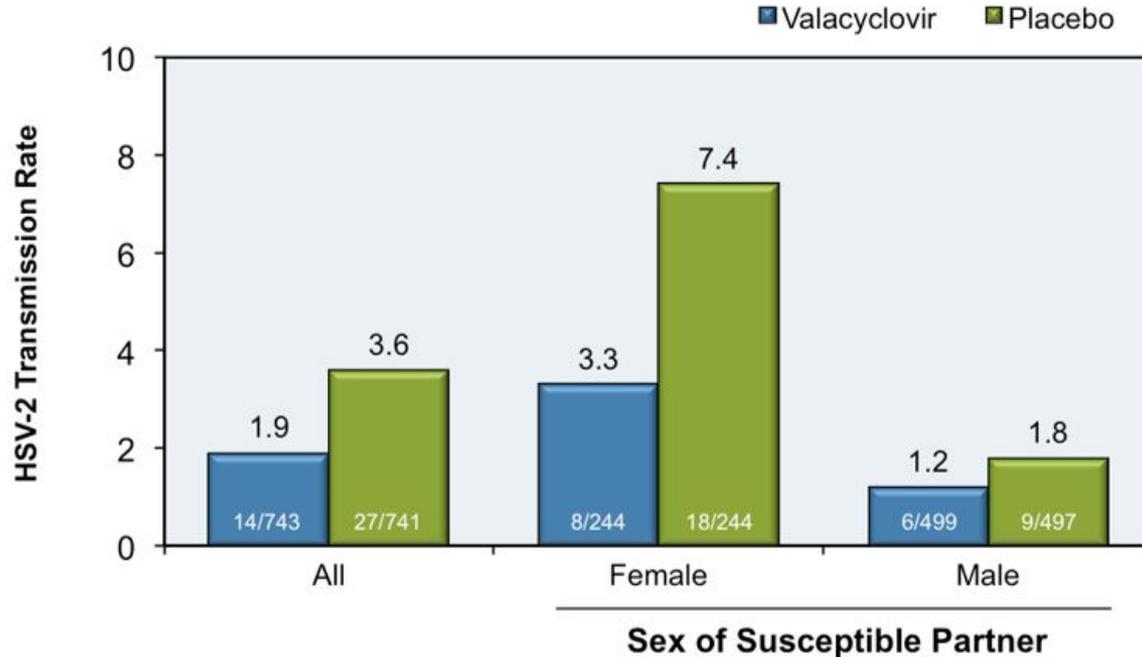
- Acyclovir 400 mg orally 3 times daily for 5 days, or
- Famciclovir 125 mg orally 2 times daily for 5 days, or
- Valacyclovir 1 g orally once daily for 5 days

# Recommended Regimens – Suppressive Therapy

Reduces the frequency of recurrences by 70%-80%. Quality of life is improved in many with frequent recurrences.

- Acyclovir 400 mg orally 2 times daily, or
- Famciclovir 250 mg orally 2 times daily, or
- Valacyclovir 500 mg orally once daily

# Reduced Risk of Transmission on Suppressive Therapy



Once Daily Valacyclovir to Reduce the Risk of Transmission of Genital HSV

Source: Corey L, Wald A, Patel R, et al. *N Engl J Med*. 2004;350:11-20.

# HSV: Summary

- Screening is not recommended for the general population.
- Antiviral therapy can be used to treat symptoms, prevent recurrences and reduce shedding/transmission.
- Counseling is integral to the management.

# Urethritis/Cervicitis

Chlamydia

Gonorrhea

# Chlamydia

- Most common bacterial STI in the US
- Most common in teens and young adults (age 15-24)
- 18 serologically variant strains
  - Serovars D through K cause genital tract infections
  - Serovars L1-L3 are the cause of lymphogranuloma venereum
- Can spread from mother to baby at birth
- Risk factor for other STIs including HIV

# Chlamydia: Clinical Manifestations

- Often a "silent" infection with few symptoms
- Cervicitis, urethritis, epididymitis, proctitis/proctocolitis
- PID, infertility and ectopic pregnancy
- Reactive arthritis (Reiter syndrome)
- Conjunctivitis, trachoma, pneumonia, in infants

# Chlamydia: Diagnostics

Nucleic Acid Amplification Test (NAAT) is the test of choice

FDA cleared

- Male and female urine
- Vaginal and endocervical swabs
- Male urethral swabs
- Rectal and pharyngeal swabs
- Self-collected vaginal/ rectal swabs in clinical setting

# Chlamydia Treatment

## Recommended regimens (non-pregnant):

- Doxycycline 100 mg orally twice daily for 7 days\*

## Alternative regimens (non-pregnant):

- Azithromycin 1 g orally in a single dose **OR**
- Levofloxacin 500 mg orally once daily for 7 days

# Chlamydia Treatment: Pregnancy

## **Recommended regimen**

- Azithromycin 1 g orally in a single dose

## **Alternative regimens**

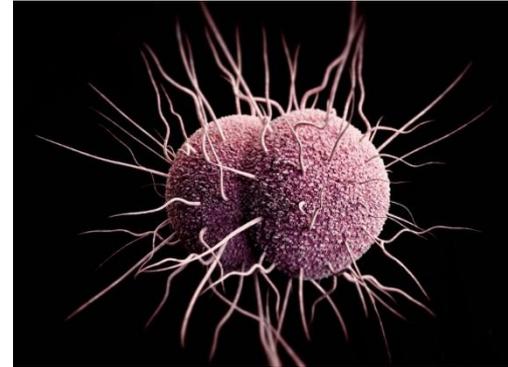
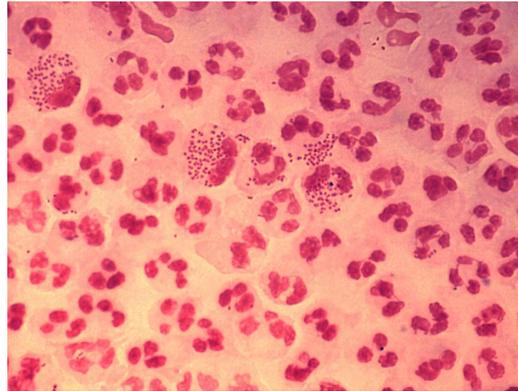
- Amoxicillin 500 mg orally three times a day for 7 days

\* Test of cure at 3-4 weeks only in pregnancy

# Gonorrhea: Clinical Presentation

- Short IP of 2-7 days
- Array of urogenital, pharyngeal, and rectal symptoms
- Serious complications, such as PID, infertility, ectopic pregnancy, neonatal conjunctivitis.
- Rarely, disseminated gonococcal infection (DGI). fever, arthritis, tenosynovitis and cutaneous pustules.
- Increased susceptibility to HIV acquisition/transmission.

# Gonorrhea



# Disseminated Gonococcal Infection



# Gonorrhea: Diagnostics

- NAAT is the test of choice, FDA cleared for:
  - Male and female urine
  - Vaginal and endocervical swabs
  - Male urethral swabs
  - Rectal and pharyngeal swabs
  - Self-collected vaginal/ rectal swabs in clinical setting
- Cultures have lower sensitivity

# Gonorrhea Treatment Guidelines

## Uncomplicated Infection

Ceftriaxone 500 mg IM x 1  
for persons weighing <150kg

\*For persons weighing  $\geq 150$  kg, 1 g of IM  
ceftriaxone should be administered

- **Test-of-Cure at 7-14 days post treatment for pharyngeal gonorrhea.** Pharynx may be an important reservoir. This is a clinical and public health challenge.

# Gonorrhea: Summary

- Screen
  - HIV-infected M and F
  - Sexually active MSM at all sites
  - Sexually active F <25 y
  - Other high-risk groups
- Treat partners in preceding 60 d.
- Utilize Expedited Partner Therapy

# Expedited Partner Therapy for GC/CT

- No states prohibit EPT
- Previously only recommended for hetero men/women, now “shared decision making” for MSM
- Partners (especially adolescents) may not fill prescriptions
- Treat partners in previous 60 days
- Rescreen 3 mo after Rx (Re-test for syphilis at that time)

*Mycoplasma genitalium*  
&  
*Trichomonas vaginalis*

# M. *genitalium* Screening and Testing

- More than 1 in 4 men with urethritis have *Mycoplasma genitalium*
- Population based screening is not recommended. Be-wary of multiplex assays
- Diagnostic testing: NAAT, FDA approved for urine, urethral, penile meatal, endocervical, vaginal specimens
- When to test: persistent urethritis that fails initial treatment, also consider for persistent PID or cervicitis
- May be associated with preterm birth. Adjusted OR, 95% CI = 2.34 (1.17, 4.71)
- Resistance is a significant problem

# M. genitalium Sequential Treatment

Start with Doxycycline to reduce bacterial load

Doxycycline 100 mg  
BID x 7 days



Moxifloxacin 400 mg  
BID x 7 days

If local macrolide resistance is low or known macrolide sensitive

Doxycycline 100 mg  
BID x 7 days



Azithromycin 2.5 gm  
over 4 days

(Azithromycin- 1 gm x 1 day then 500 mg daily x 3 days)

Extended duration Azithromycin (5 d course) may be an option for rx during pregnancy)

# Trichomonas: A Neglected STI

Associated with preterm birth and other **adverse pregnancy outcomes**, cervical cancer and HIV acquisition

## **Females**

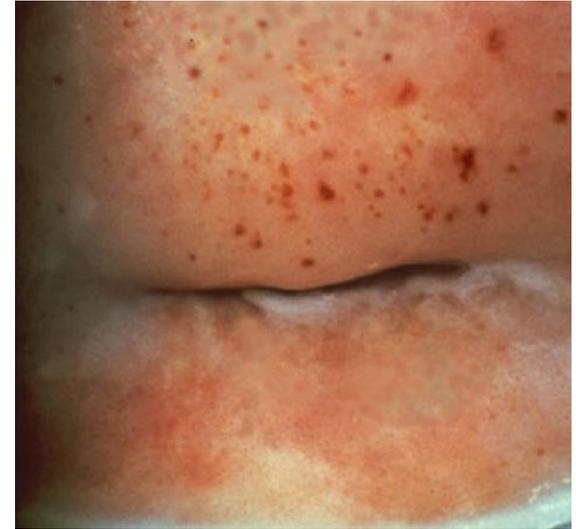
Dysuria, vulvar itching, and malodorous frothy discharge

Strawberry cervix - friable with punctate hemorrhages.

## **Males**

Dysuria and penile discharge

May also be asymptomatic.



# *T. vaginalis* Screening/Diagnostic testing

- Screening is recommended for
  - Women with HIV and in correctional settings
  - Consider for other high prevalence settings
- Screening for men is not recommended. Rare in MSM
- Extragenital *T. vaginalis* is rare. Rectal and oral testing is not recommended
- Diagnostic testing: Patients with vaginal discharge
- Multiple FDA-cleared **NAAT tests**- urine, urethral, endocervical, vaginal

# Trichomoniasis Treatment

Vaginal trichomonas (HIV+/HIV-)

Metronidazole 500 mg orally BID x 7d

Men w/ trichomonas or male partners)

Metronidazole 2 g orally single dose

Alternative regimen:

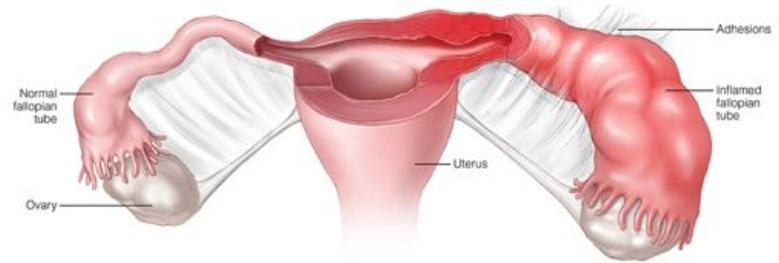
Tinidazole 2 gm orally in a single dose

Retest for reinfection in 3 months

# STI Syndromes

# Pelvic Inflammatory Disease

- Dx – cervical motion, uterine or adnexal tenderness
- Many can be treated as outpatients. Hospitalize pregnant or immunocompromised, or if tubo-ovarian abscess, peritonitis, severe symptoms.



- Ceftriaxone 500 mg IM x 1 plus
- Doxycycline with or without Metronidazole x 14 days

# Epididymitis

In young men: *C. trachomatis* (70%); *N. gonorrhoeae* (30%)

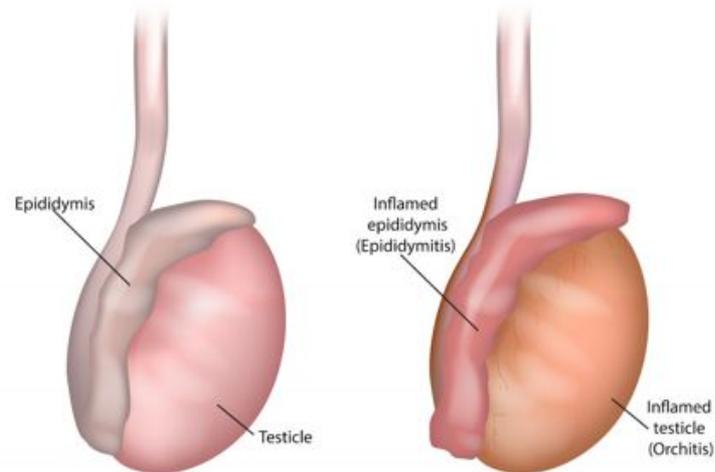
– Ceftriaxone 500 mg IM x 1 + doxycycline x 10 d

– Ceftriaxone 500 mg IM x 1 + levofloxacin x 10 d (insertive anal)

In older men

*E. coli* in majority

– Rx levofloxacin x 10 d



## Case #4

35 yo MSM with HIV infection on ART, recent unprotected sex presents to the ED with fever, rash and rectal pain. Exam showed three solitary skin lesions on the rt arm, finger and in the perianal area. What tests will you perform?

1. Rectal NAAT for GC and chlamydia
2. HSV serologies.
3. HSV PCR
4. Mpox PCR
5. Syphilis serology



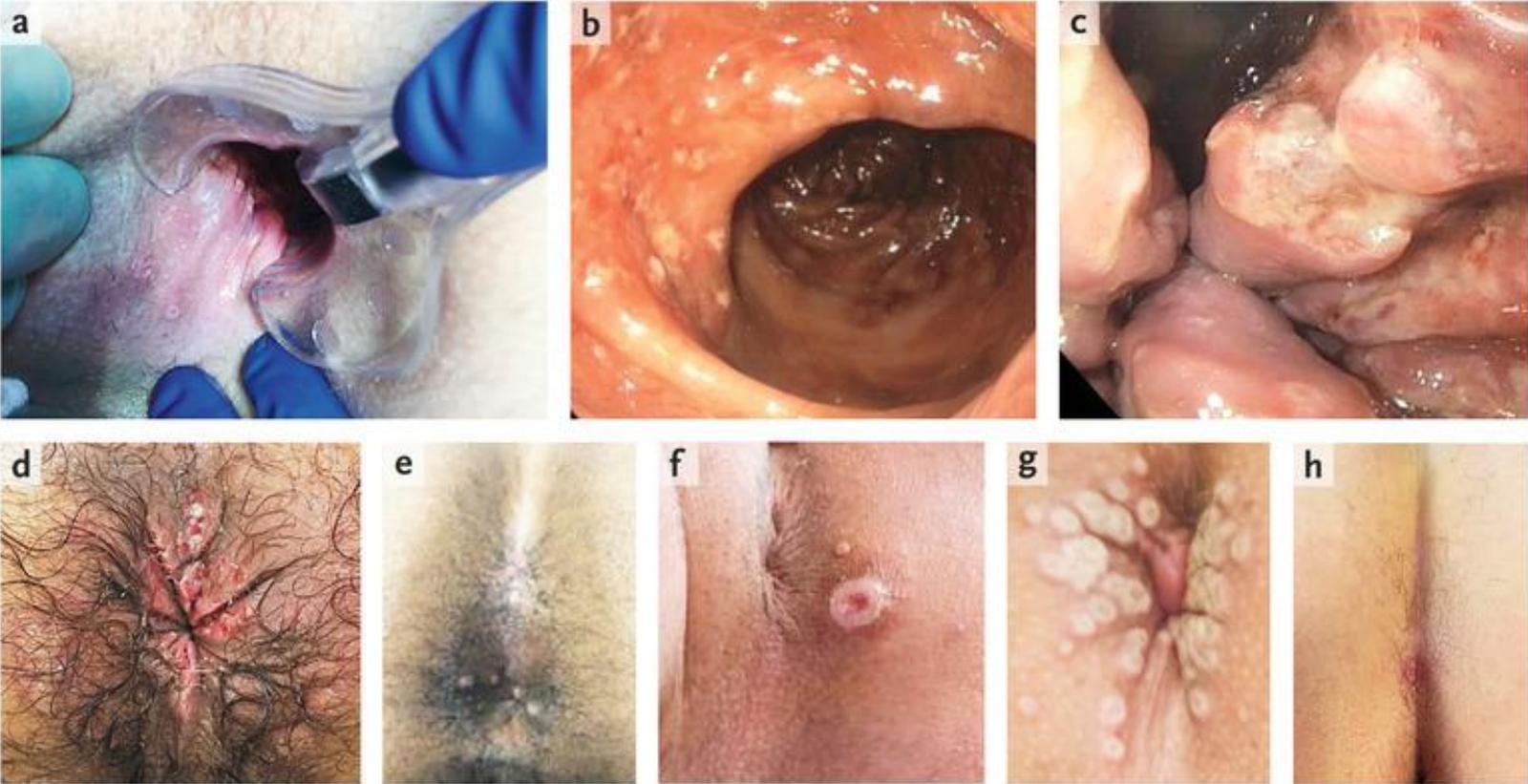
# Proctitis

- Etiologies: *N. gonorrhoeae*, *C. trachomatis*, *T. pallidum*, HSV. Other – *Campylobacter*, *Shigella*, *Entamoeba*, *Giardia*
- Rx – Ceftriaxone 500 mg IM x 1 + doxycycline x 7 d
- If bloody discharge/perianal ulcers, treat for LGV with doxycycline x 3 wk



**Think Mpox**

# Mpox: Perianal, Anal and Rectal Lesions, 2022 Outbreak



# Oral and Perioral Lesions, 2022 Outbreak

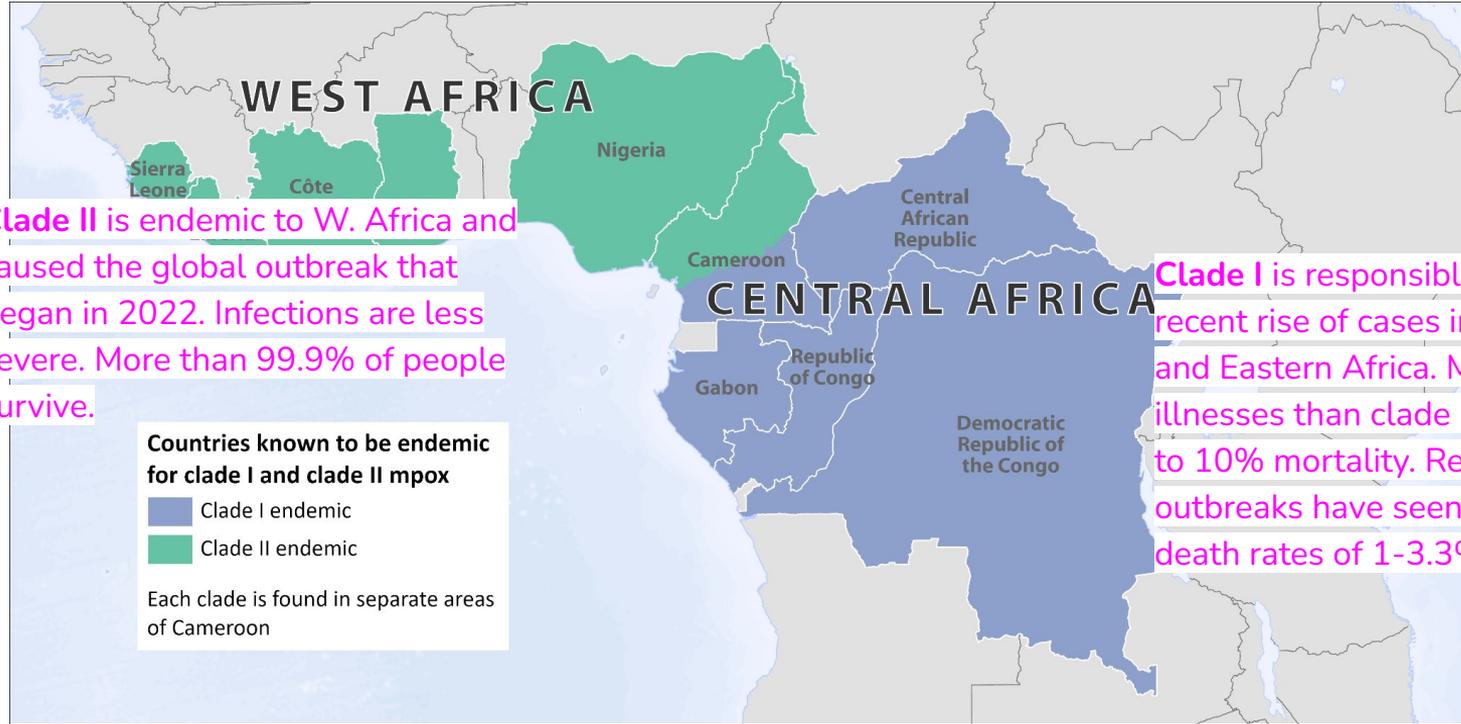


Firm, deep-seated well-circumscribed lesions, often with umbilication



CDC.GOV

# Mpox Clades



# Mpox Clade II and I Outbreaks

- **Clade II** was the source of the health crisis in **2022**, when cases escalated rapidly in dozens of countries, mostly among MSM. The US averaged 500 cases/day. Infections were rarely fatal, but many suffered painful skin lesions for weeks. Outbreaks waned later in 2022. **Sporadic cases continue to occur.**
- **Clade I** emerged in early **2024** in Congo/ neighboring African countries, and is deadlier. WHO declared it a global health emergency from Aug- Sep. 2024. Spread has been limited. The U.S. reported six cases in people with recent travel to Africa. Health authorities in Southern California have reported three cases in Oct- Nov 2024 in people with no recent travel. All three individuals have recovered from the illness.

The vaccine is effective, and two doses are better than one.

**TABLE 2. JYNNEOS vaccination history and estimated vaccine effectiveness among case-patients with mpox and control patients with sexually transmitted infections — New York,\* July 24, 2022–October 31, 2022**

Vaccination status	Mpox case-patients (n = 252)	All STI controls (n = 255)	
	No. (%)	No. (%)	VE (95% CI)
Unvaccinated	230 (91.3)	204 (80.0)	Ref
0–13 days after first dose	10 (4.0)	9 (3.5)	–36.2 (<–100 to 56.3)
≥14 days after first dose	10 (4.0)	23 (9.0)	68.1 (24.9 to 86.5)
≥0 days after second dose	2 (0.8)	19 (7.5)	88.5 (44.1 to 97.6)
≥14 days after first dose or ≥0 days after second dose	12 (4.8)	42 (16.5)	75.7 (48.5 to 88.5)

**Abbreviations:** Mpox = monkeypox; Ref = referent group; STI = sexually transmitted infection; VE = vaccine effectiveness.

\* Outside of New York City

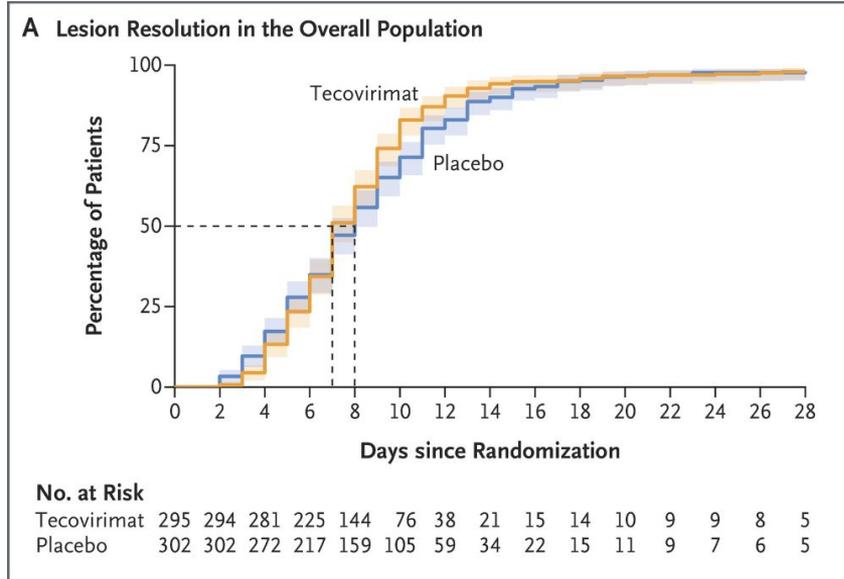
# Mpox tends to be milder among people who acquire it despite vaccination.

Compared to people who have never been vaccinated, those who have mpox despite full vaccination

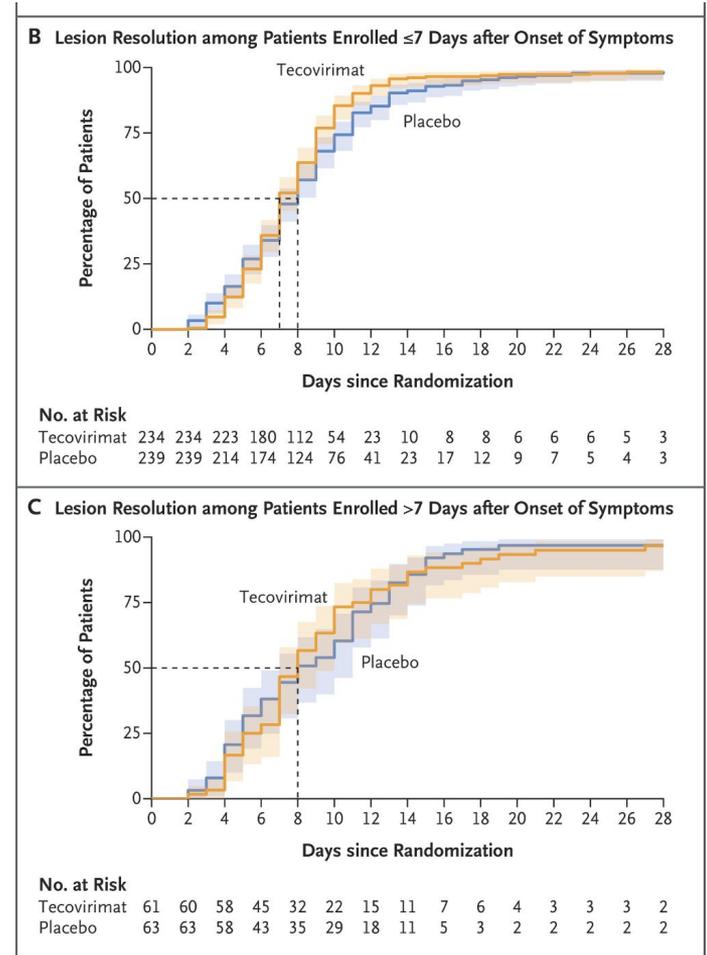
- Have **lower** odds of hospitalization, death, systemic illness, fever, headache, malaise
- Have **fewer** skin lesions

# Tecovirimat for Clade I MPXV Infection in the Democratic Republic of Congo

N Engl J Med 2025;392:1484-1496



*Cumulative Incidence of Lesion Resolution in the Intention-to-Treat Population.*



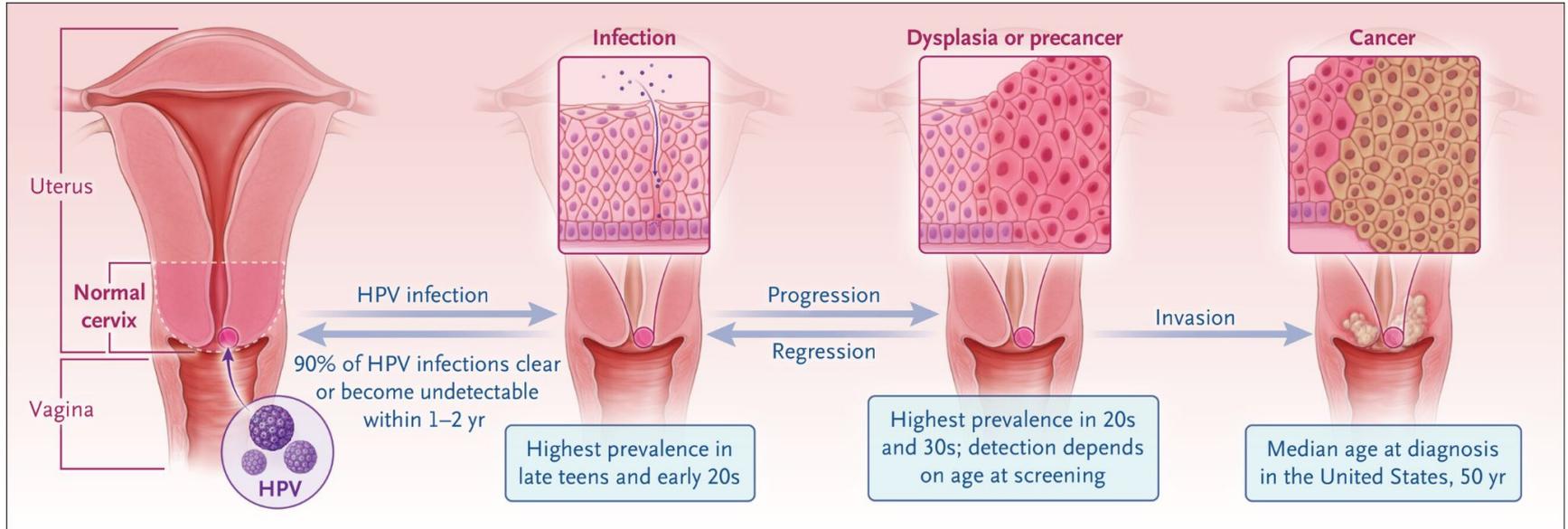
# HPV Infection and Vaccination

# Case Vignette

- A 24-year-old woman is being seen for routine health care.
- She has not received any vaccinations against HPV.
- The patient initiated sexual activity at 18 years of age and has had three male sex partners.
- What would you recommend regarding HPV vaccination?

HPV is the most common STI in the US and worldwide.

# Natural History of HPV Infection



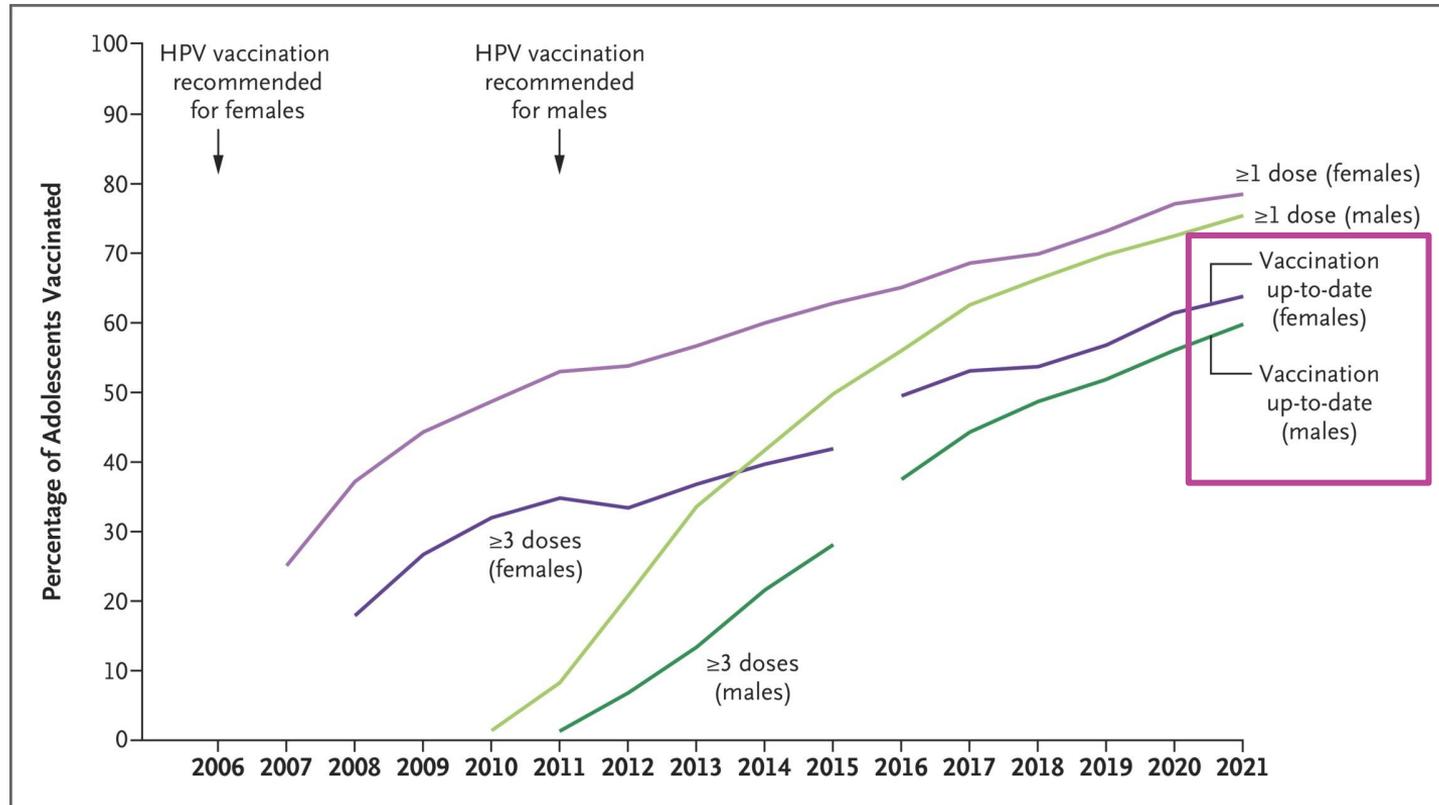
## Cancers Associated with and Attributed to HPV in the US, 2015–2019

Cancer Site	No. of HPV-Associated Cancers	Percentage of Cancers Probably Caused by Any HPV Type
Cervix	12,293	91
Vagina	879	75
Vulva	4,282	69
Penis	1,375	63
Anus‡	7,531	91
Oropharynx	20,839	70
Total	47,199	79

*A*

The NEW ENGLAND  
JOURNAL of MEDICINE

# HPV Vaccine Coverage among Adolescents 13 to 17 Y, 2007–2021



# HPV Infection and Vaccination

- All adolescents at age 11 or 12 y, starting at age 9 y.
- Catch-up vaccination through 26 y
- Shared clinical decision-making ages 27–45 y
- 2-dose schedule (0- and 6–12-mo) for <15y.
- 3-dose schedule (0-, 1–2, and 6-mo) for immunocompromised persons any age and for >15 y

# Pre-Exposure Prophylaxis (PrEP)



# Pre-Exposure Prophylaxis (PrEP)



**PrEP** is the use of antiretroviral medications by people without HIV to protect against acquiring HIV from sex or injection drug use

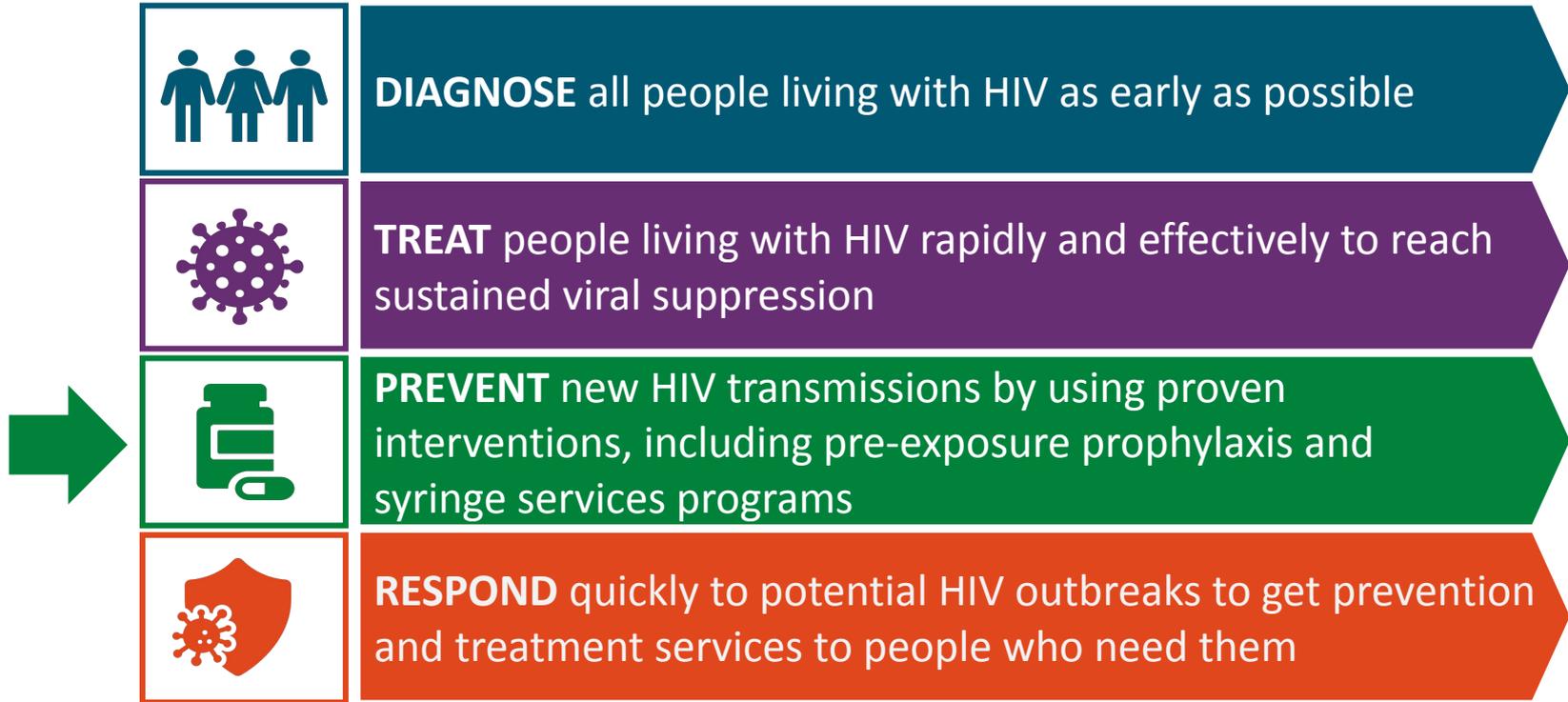


Taken consistently, **PrEP** reduces the risk of acquiring HIV from sex by ~99% and from injection drug use by ≥74%

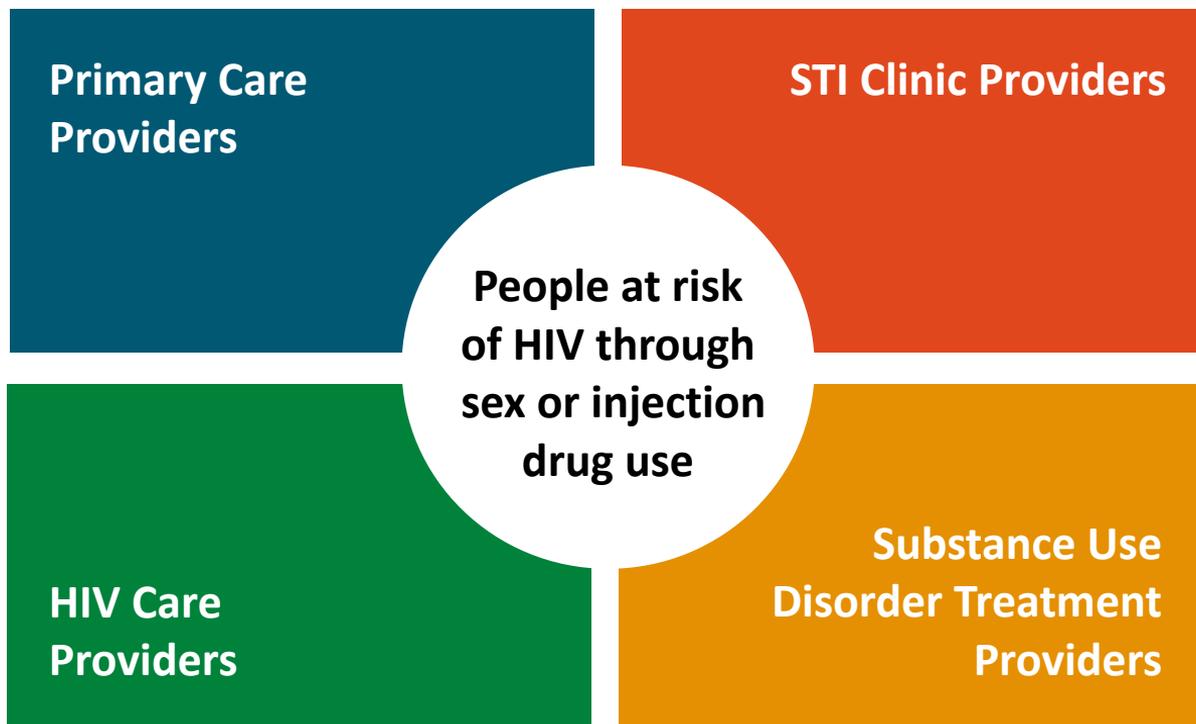


**PrEP** is recommended for adults and adolescents weighing  $\geq 35$  kg (77 lb) who are at risk of acquiring HIV

# Ending the HIV Epidemic in the United States



# Who Can (and Should) Provide PrEP? You!



## Provider types:

- MDs
- APPs
- Community-based organizations in HIV/PrEP field

# Current PrEP Options



- **Cabotegravir (CAB) 600 mg: IM injection every 2 mo (long-acting)**



- **Emtricitabine (FTC) 200 mg + tenofovir disoproxil fumarate (TDF) 300 mg: once daily\* oral pill**



- **FTC 200 mg + tenofovir alafenamide (TAF) 25 mg: once daily oral pill<sup>†</sup>**

\*Off-label on-demand use of FTC/TDF for cisgender men supported by international guidelines. PK data may support on-demand for all populations.

<sup>†</sup>Currently for cisgender men and transgender women only.

# FDA-Approved PrEP Regimens by Population

Population*	Daily FTC/TDF	Daily FTC/TAF	Injectable CAB
Men who have sex with men	FDA approved, guideline recommended <sup>1-3</sup>	FDA approved, guideline recommended <sup>2-4</sup>	FDA approved, guideline recommended <sup>2,5</sup>
Transgender women			
Cisgender men			
Cisgender women <sup>†</sup>		Off label, not recommended	FDA approved, guideline recommended (except in pregnancy) <sup>2,5</sup>
Transgender men			

\*For people who inject drugs, sexual risk should be assessed and considered. CDC guidelines state that people who inject drugs are likely to benefit from any FDA-approved medication for PrEP with or without a sexual risk indication.<sup>3</sup>

<sup>†</sup>Includes other gender identities where HIV could be acquired through vaginal sex.

# PrEP FTC/TDF vs FTC/TAF

Effectiveness, %	FTC/TDF	FTC/TAF
Men who have sex with men and transgender women	~99	~99
Heterosexual men and women	~99	Unknown
People who inject drugs	74-84	Unknown

- Generic available for FTC/TDF (not for FTC/TAF)

## ▪ Bone and renal health

- Incremental changes in lab markers of bone metabolism and renal function with FTC/TDF, but no differences in clinically relevant AEs vs FTC/TAF

## ▪ Lipid and weight changes

- Higher rates of triglyceride elevations and weight gain with FTC/TAF vs FTC/TDF

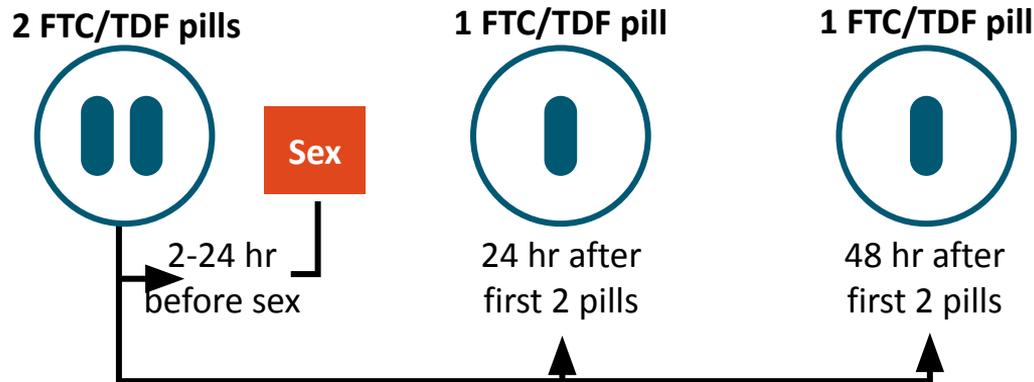
# PrEP CAB vs FTC/TDF

Outcome	CAB vs FTC/TDF	
<b>Efficacy</b>	<ul style="list-style-type: none"><li>▪ HPTN 083: men who have sex with men and transgender women</li><li>▪ HPTN 084: cisgender women</li></ul>	
<b>Safety</b>	<ul style="list-style-type: none"><li>▪ Renal</li><li>▪ Weight</li></ul>	
<b>Generic available?</b>	CAB: No	FTC/TDF: Yes
<b>Nondaily?</b>	CAB: Yes	FTC/TDF: No

1. Landovitz. NEJM. 2021;385:595. 2. Delany-Moretlwe. Lancet. 2022;399:1779.

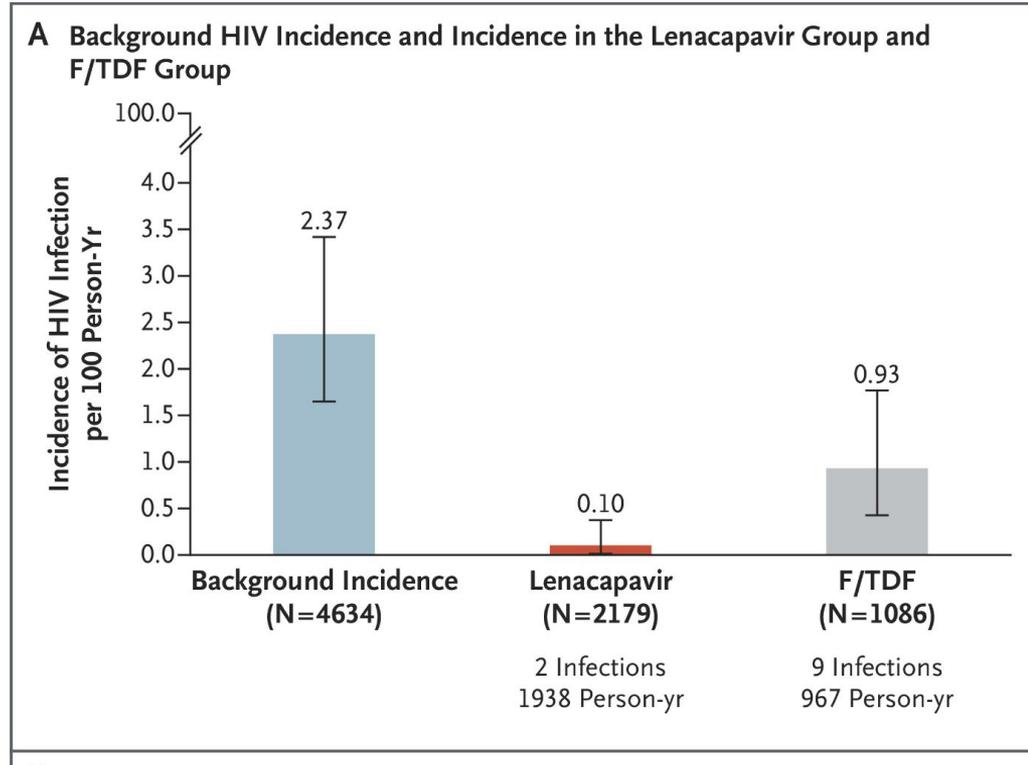
# On-Demand Oral FTC/TDF PrEP: Another Option for Cisgender Men Who Have Sex With Men

- On-demand “2-1-1” PrEP regimen (timing based on when someone plans to have sex):



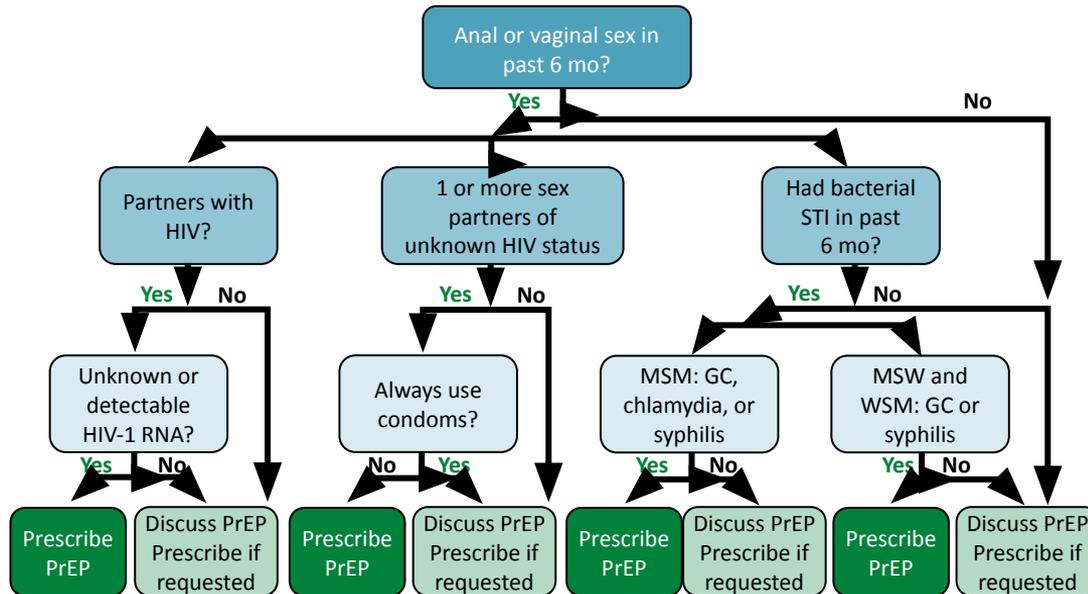
- On-demand FTC/TDF is not FDA approved but is recommended by IAS-USA guidelines; it is not recommended for HBV coinfection, those who may have difficulty adhering to 2-1-1 dosing regimen, and populations at risk of HIV acquisition from vaginal exposure

# Lenacapavir on the Horizon



# PrEP Guidance: CDC

**“All sexually active** adults and adolescents should be informed about PrEP for prevention of HIV acquisition”



Anyone who requests PrEP should be prescribed PrEP (recognizes that people who request PrEP may have undisclosed risk behaviors)

All pathways lead to prescribing or discussing PrEP!

# How Long Does PrEP Take to Work?

- **With daily oral PrEP<sup>1</sup>:**
  - For **receptive anal sex** (bottoming): maximum HIV protection reached at **~7 days** of daily use
  - For **receptive vaginal sex** and **injection drug use**: maximum HIV protection reached at **~21 days** of daily use



# PRESCRIBING DOXY PEP TO PREVENT STIS

Did You Know?

Doxycycline post-exposure prophylaxis (**doxy PEP**) has proven to reduce the risk of getting some **sexually transmitted infections (STIs)** for some people

## PER CDC GUIDELINES...



Discuss **doxy PEP** with those who would benefit the most



If offering, write a prescription for patients to self-administer 200 mg doxycycline within **72 hours** after sex, with enough doses until next follow-up visit



Offer doxy PEP in the context of comprehensive **sexual health approach**



# Back to Case #1: Multiple Missed Opportunities

ID: 27 year old software engineer presents to the ED with pleuritic chest pain and dyspnea on exertion for 1 month.

1. Aug 2022- ED visit for high fevers/sore throat. Neg COVID, Strep and Mono screen. Discharged on prednisone.
2. Aug 2022 - Returned 2 d later. Neck CT done -> cervical lymphadenopathy
3. Oct 2022- Blood in stools x 1 month → colonoscopy done
4. Aug 2023 - Rectal bleed
5. April 2024 - Anal fissure
6. Sept 2024 - Perianal abscess
7. Aug 2025 - SOB and pleuritic CP → cardiac w/u and CTPA→ home on Doxy
8. Aug 2025- back with worsening SOB and pleuritic CP→ CTPA



Ultimately, diagnosed with AIDS, CD4 count of 6 and VL of appx. 100K. BAL with Pneumocystis.  
Now on PJP Rx, ART, and Azithro for MAC prophylaxis.

# Take Home Points

- STIs have tremendous health and economic consequences. Facilitate HIV transmission and cause PID/ infertility, chronic pelvic pain, poor birth outcomes.
- Recognize “priority populations” most impacted by STIs: adolescents and young adults, MSM, and pregnant women.
- Take sexual history. Avoid assumptions. Promote a nonjudgmental environment.
- Screen for HIV. Screen for STIs
- Vaccinate for HPV
- Offer HIV PrEP for ongoing high-risk exposures.
- Consider Doxy PEP for MSM and trans women with increased likelihood for STI

Remember we are all a critical stakeholder.