



Sexually Transmitted Infections: What's New in Prevention, Diagnosis & Management

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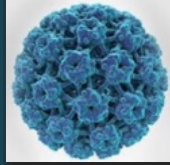


This activity is jointly provided by Physicians' Research Network and the Medical Society of the State of New York.

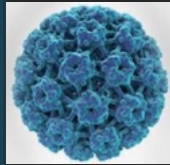
Disclosures

Nothing to Disclose

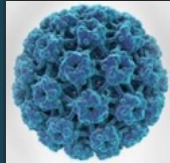
Discussion Objectives



Screening recommendations for populations most impacted by STIs.



Epidemiology of Vaccine Preventable STIs (HPV, HAV, HBV, MPX)



Pharmaceutical Spotlights:
- Bicillin LA-shortage
- Doxy PEP for STI prevention

Screening



STI Screening: Non-Pregnant Cis-Women (*partners of any gender*)

Women under 25 years of age

- Chlamydia/gonorrhea annually
- HIV at least once
- Hep C at least once if ≥ 18 yo (unless prevalence of Hep C $< 0.1\%$)

Women 25 years of age and older

- Chlamydia/gonorrhea if at risk
- HIV at least once
- Hep C at least once (unless prevalence of Hep C $< 0.1\%$)

Screening not recommended for *M. genitalium* or trichomonas

STI Screening: Pregnant Cis-Women (*partners of any gender*)

Everyone

- **HIV @ first prenatal visit;**
 - If at risk, retest during 3rd trimester by 36 weeks.
 - **Syphilis @ first prenatal visit**
 - If at risk, retest during 3rd trimester (ideally at 28 weeks) PLUS delivery.
 - **HepB sAg @1st prenatal (even if vaccinated or previously tested)**
 - **Hep C (unless prevalence of Hep C < 0.1%) WITH EVERY PREGNANCY**
- If <25 years of age or with risk:
- **Chlamydia and Gonorrhea @ first prenatal plus retest in 3rd trimester**

Screening not recommended for *M. genitalium* or *trichomonas*

STI Screening: Cis-Men who have Sex with Men (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 ≥ 18 yo, unless prevalence of infection $< 0.1\%$)
- Anal cancer: annual digital anorectal exam may be useful (no anal Pap rec yet)
- HSV-2 serology (consider)

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

Screening not recommended for *M. genitalium* or trichomonas

STI Screening: Transgender (TG) Persons

Based on current anatomy and gender of sex partners

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

Transgender women post vaginoplasty

- GC/CT at all sites of exposure: (oral, anal, genital)
 - Urine vs neovaginal swab not specified, best specimen type based on tissue type used to construct neovagina.

Transgender Men post metoidioplasty

- If vagina still present and need to screen for STIs, use cervical/vaginal swab

STI Screening: Adolescents

- **Chlamydia/Gonorrhea**
 - Female - Yes. Consider rectal screening (GC/CT) and pharyngeal (GC)
 - Male with female-only partners - Shared decision, consider in setting serving populations with high incidence
- **HIV:** Offer to all adolescents. Frequency based on risk.
- Routine screening for syphilis, trichomoniasis, BV, HSV, HAV, and HBV is not typically recommended.
- **T. vaginalis:** Consider local prevalence when deciding whether to screen
- **Syphilis:** Young MSM and pregnant females should be routinely screened

Sexual Assault: Adolescents and Adults

Evaluation: “An initial examination after a sexual assault might include the following:”
(decide on case-by-case basis) **Includes both Males and Females**

- **NAATs for GC/CT** at sites of penetration or attempted penetration
- **Serology HIV, HBV, and syphilis**

Females:

- NAAT testing for *T. vaginalis* (urine or vaginal)
- POC or wet mount with pH/KOH for BV/candidiasis, especially if Sx

MSM:

- GC/CT screening if receptive oral or anal sex during the preceding year, regardless of whether contact occurred at these sites during the assault.
- Consider anoscopy if reported anal penetration.

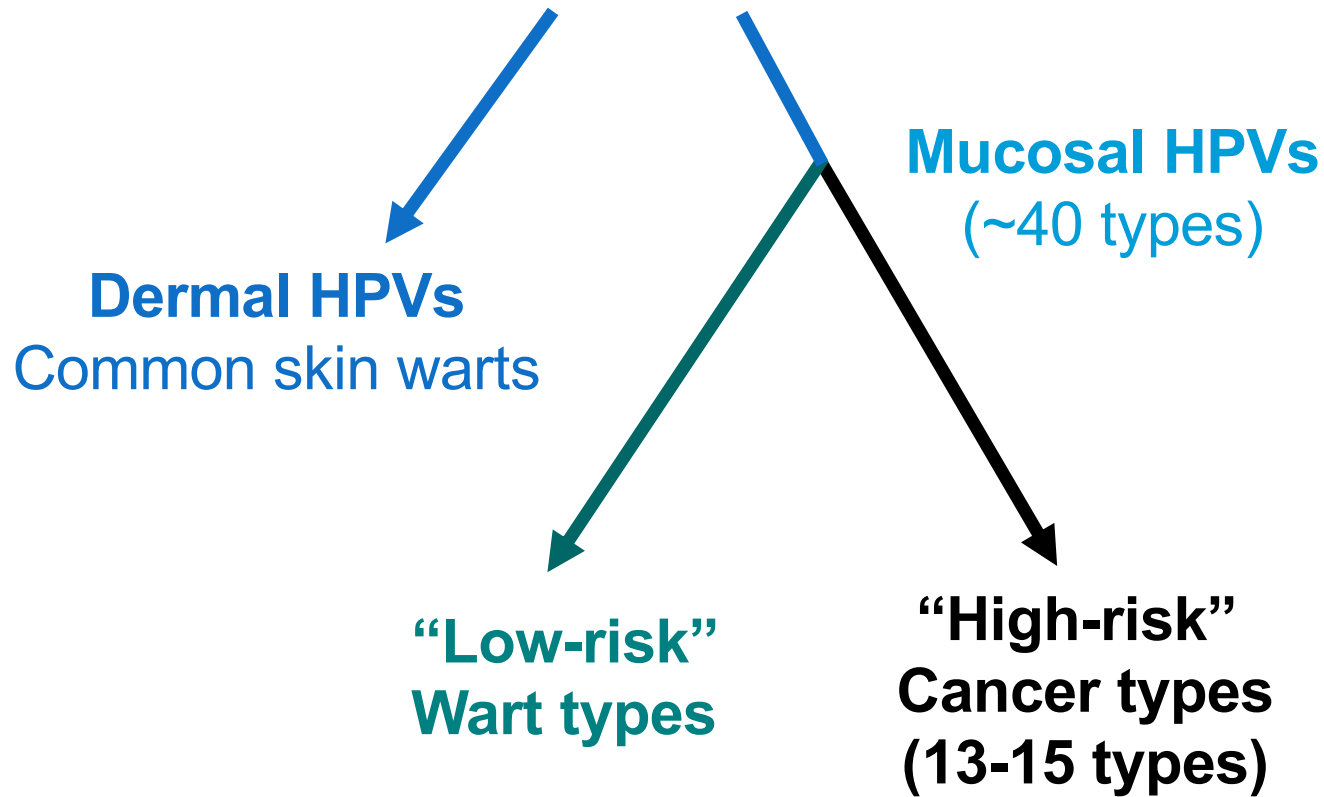


Vaccine Preventable STIs



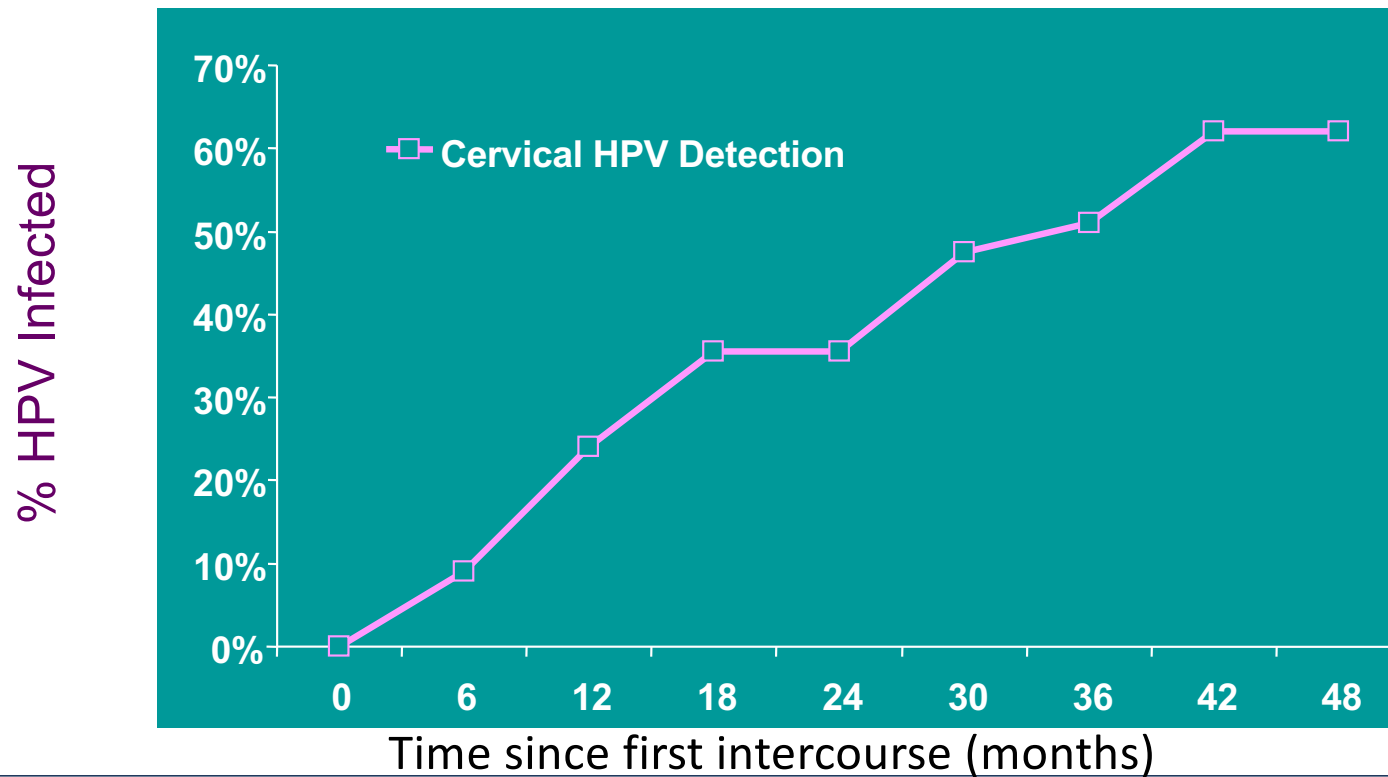
Slide courtesy of Dr. Ina Park

The HPV Family



Slide courtesy of Dr. Ina Park

Acquisition of HPV among unvaccinated young women



Collins et al. Br J Obstet Gynecol 2002;109:96

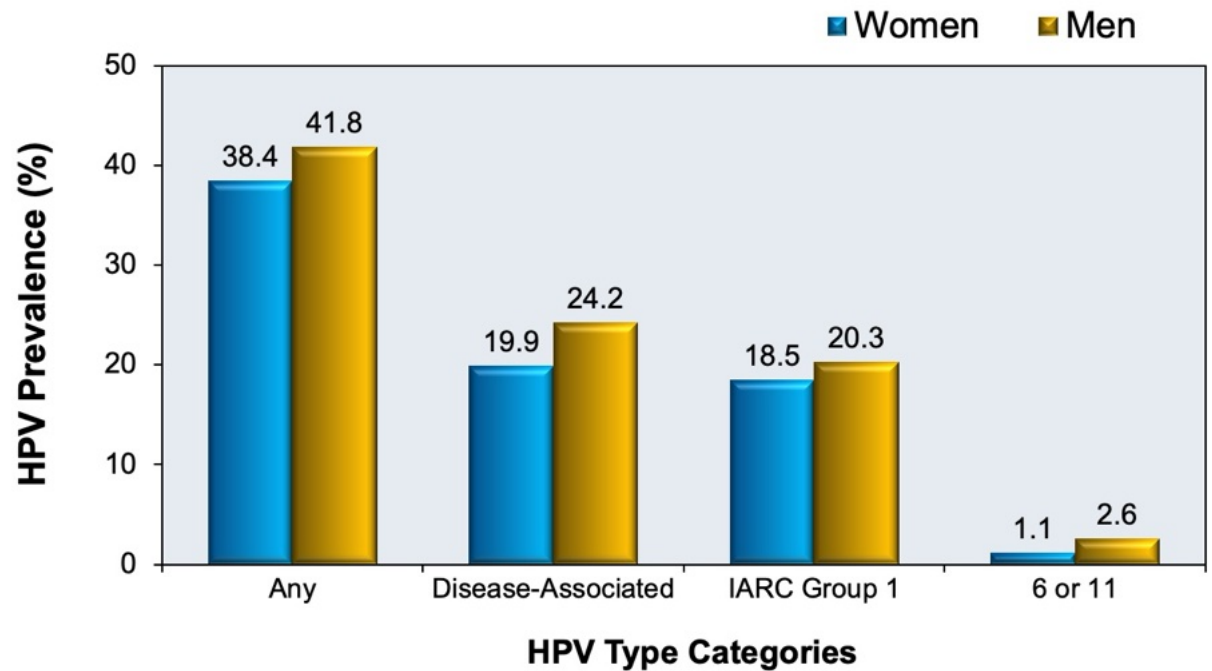
“HPV is so common that almost every person who is sexually-active will get HPV at some time in their life if they don’t get the HPV vaccine.”

– Centers for Disease Control and Prevention

- **~43 million HPV infections in 2018.**
 - 13 million were new infections.
- **Genital warts:** Pre-HPV vaccine, 340,000- 360,000 people annually
 - 1% of sexually active adults in the U.S. has genital warts at any given time.
- **Cervical cancer:** ~12,000 cases diagnosed annually in the US,
 - >4,000 deaths—even with screening and treatment.
- Including all other HPV-related cancers, ~31,500 people are affected by cancer caused by HPV.

Estimated HPV Prevalence for Persons Aged 15-59 Years, United States, 2013-2016

Lewis RM, Laprise JF, Gargano JW, et al. Estimated Prevalence and Incidence of Disease-Associated Human Papillomavirus Types Among 15- to 59-Year-Olds in the United States. Sex Transm Dis. 2021;48:273-7.



Any HPV = any of 37 types detected using Linear Array

IARC Group 1 = Twelve HPV types are defined by the International Agency for Research on Cancer (IARC) as carcinogenic to humans (HPV 16/18/31/33/35/39/45/51/52/56/58/59)

HPV 6/11 = noncarcinogenic HPV types that cause most genital warts

Anogenital Wart (AGW)

- 2001-2012, global median annual **incidence** of any AGW (new and recurrent) **194.5 (range 160-289) per 100,000**
- Prevalence rates
 - Reviews of administrative databases or medical charts and prospective physician reports 0.13-0.56% (**130-560 per 100,000**)
 - genital examinations 0.2-5.1% (**200-5,100 per 100,000**)
- Most common in young adults
 - **Incidence peaks by age 24 years for females and 25-29 years for males**

Patel H, Wagner M, Singhal P, Kothari S. Systematic review of the incidence and prevalence of genital warts. BMC Infect Dis 2013; 13:39.

Hoy T, Singhal PK, Willey VJ, Insinga RP. Assessing incidence and economic burden of genital warts with data from a US commercially insured population. Curr Med Res Opin 2009; 25:2343.

Cervical Cancer: Global Epi

| | INCIDENCE Per 100,000 PY | MORTALITY Per 100,000 PY |
|------------------------|-------------------------------------|-------------------------------------|
| OVERALL | 13.3 | 7.3 |
| SUB SAHARAN AFRICA* | 27-40 | 17-29 |
| MELANESIA | 28 | 19 |

- 4th most common cancer in females worldwide.
- 2022: Globally, 660,000+ new cases and 340,000 deaths.
 - 210,000 maternal orphans <18 years.
- Inversely related to regional human development index (HDI).

Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA: A Cancer Journal for Clinicians*. 2021;71(3):209-249.

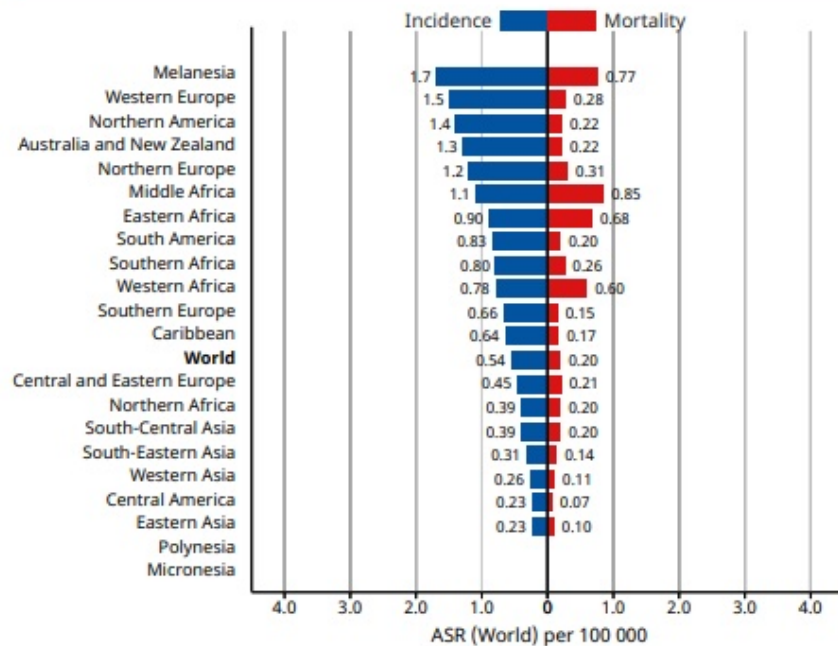
Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, Jemal A. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*. 2024 May-Jun;74(3):229-263. doi: 10.3322/caac.21834. Epub 2024 Apr 4. PMID: 38572751.

* Does not include northern Africa region

Anal CA Global Epi

2022, 30, 000 cases worldwide.
0.77/100000 py – Female; 0.60/100000 py - Males

Age standardized (World) incidence and mortality rates, anus



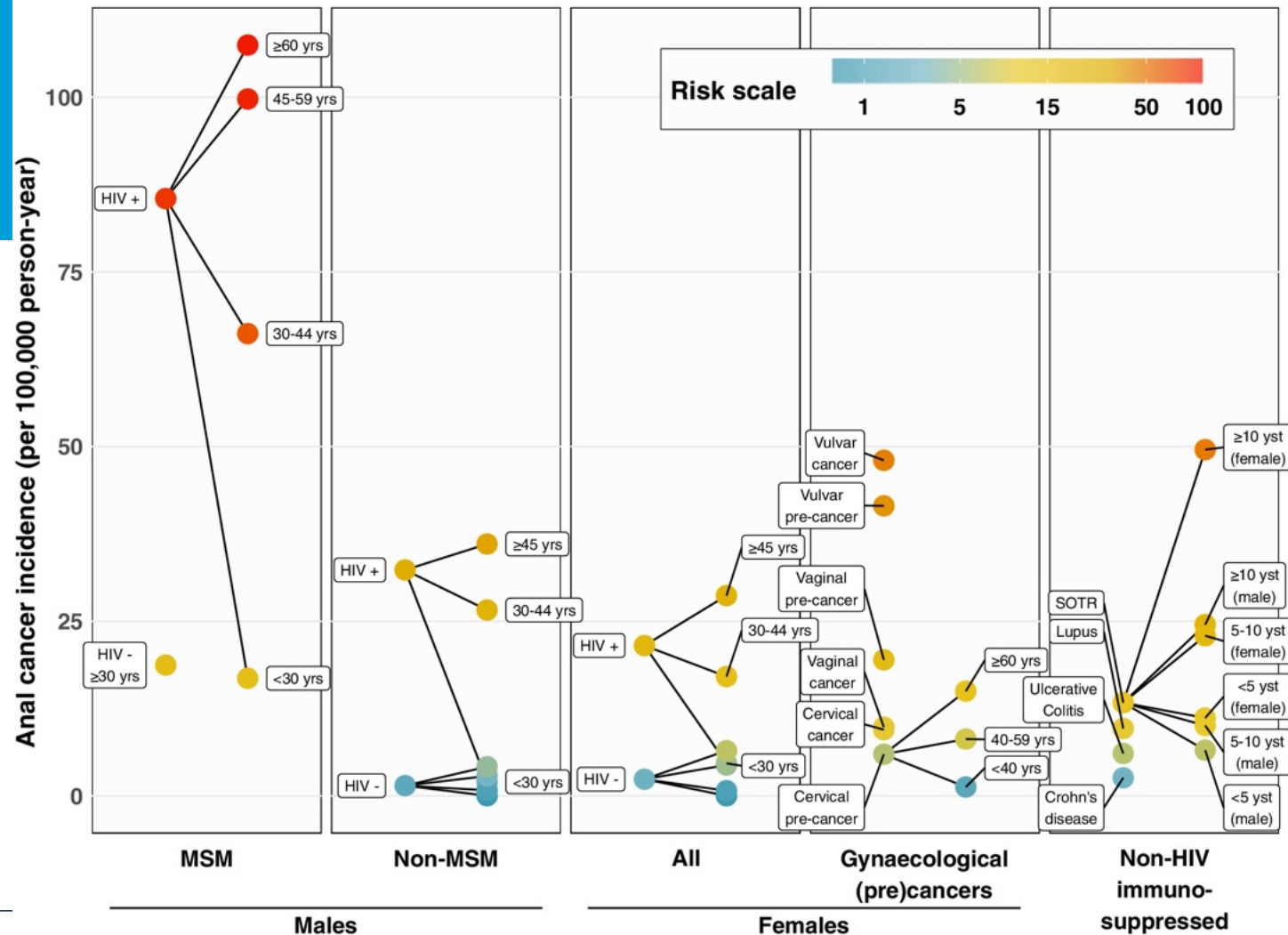
| | INCIDENCE Per 100,000 PY | MORTALITY Per 100,000 PY |
|--|------------------------------------|------------------------------------|
| OVERALL | 0.54 | 0.2 |
| MELANESIA | 1.7 | 0.77 |
| Very high HDI (US, EU, Aus/NZ) | 1.2-1.5 | 0.22-0.31 |
| SH AFRICA | 0.78-1.1 | 0.60-0.85 |

World Health Organization IAfRoC. *Anus*.

<https://gco.iarc.fr/today/data/factsheets/cancers/10-Anus-fact-sheet.pdf>: World Health Organization, International Agency for Research on Cancer;2020.

Anal Cancer Incidence By Risk Factor

- Sexual orientation, Immunosuppression and previous lower genital tract disease (e.g. vulvar dysplasia) considered
- MSM living with HIV at highest risk, esp. >30 years old
- For all groups, risk increases with age



Clifford GM, et al. A meta-analysis of anal cancer incidence by risk group: Toward a unified anal cancer risk scale. *International journal of cancer*. 2021;148(1):38-47.

HPV Vaccination



- All adolescents at age 11 or 12 years, starting at age 9 years.
- Catch-up vaccination through 26 years
- Shared clinical decision-making aged 27–45 years not vaccinated.
- 2-dose vaccine schedule (at 0- and 6–12-month intervals) persons who initiate before their 15th birthday.
- 3-dose vaccine schedule (at 0-, 1–2, and 6-month intervals) for immunocompromised persons of any age and people who initiate after 15th birthday
- Not recommended for use in pregnant women.

Vaccine Preventable Viral Hepatitis

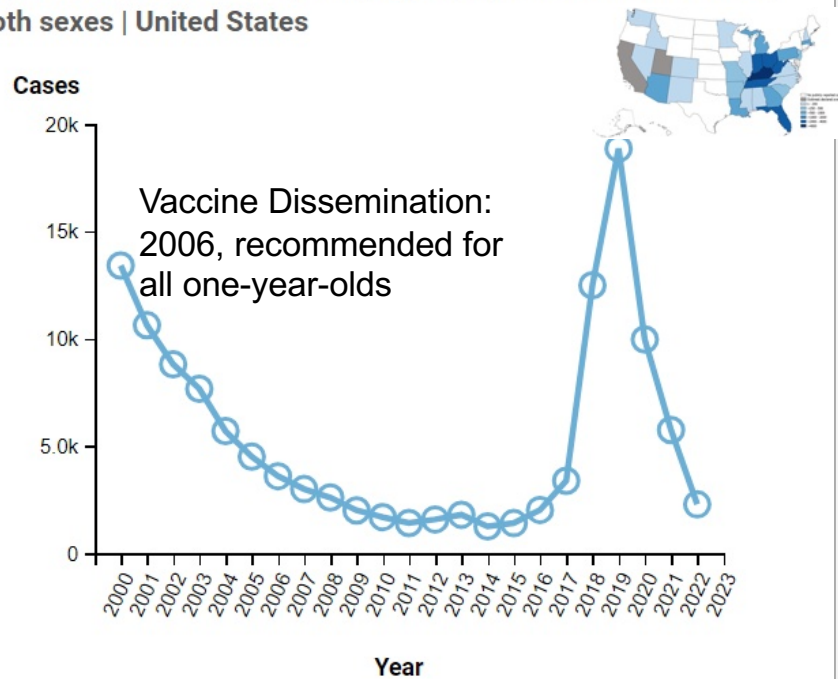
| Hepatitis A | Hepatitis B |
|--------------------|--------------------|
| 2265 cases in 2022 | 2162 cases in 2022 |
| Decrease from 2021 | Increase from 2021 |



- Relatively rare in the general population
- Multiple modes of transmission, including (but not limited to) sexual transmission
- Epidemiologic overlap w/ STI risk factors
- Surveillance varies – not typically included in STI surveillance with gonorrhea, chlamydia, syphilis, etc.

Hepatitis A

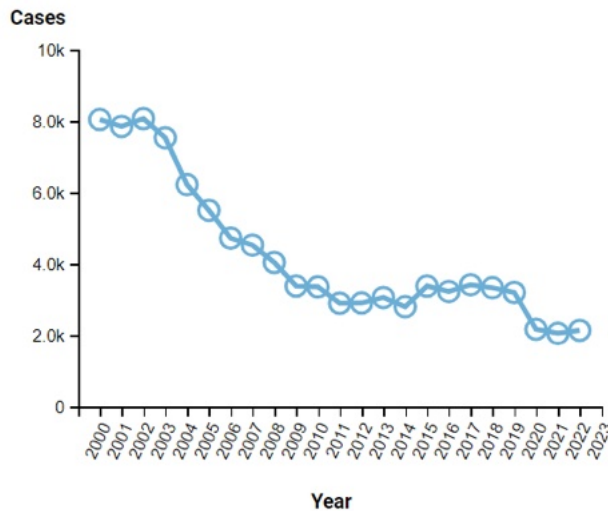
Hepatitis A | 2000-2022 | All age groups | All races/ethnicities | Both sexes | United States



- Vaccine introduced 1996
 - Very effective – hooray!
- Outbreak within the last decade (2016-2019: KY, FL, MS, OH, Phil)
 - Homelessness
 - Drug use
 - Response: wide reaching vaccination campaigns.

Hepatitis B

Acute Viral Hepatitis B | 2000-2022 | All age groups | All races/ethnicities | Both sexes | United States



MEDICAL HISTORY MOMENT:

1960's Baruch Blumberg [Fox Chase Cancer Center]: HBV antigen work, led to the vaccine, earning him the 1976 Nobel Prize.

- New approach: obtaining the immunizing antigen directly from the blood of human carriers of the virus.

1970's, Maurice Hillman [Merck]: Conducted the first large-scale trials for the blood-derived vaccine

- Performed on gay men, in accordance with their high risk for HBV.
 - *Prior to knowledge of HIV*
- Vaccine was falsely blamed for igniting the AIDS epidemic
- It was determined that the purified blood products were free of HIV.
- The purification process had destroyed all viruses—including HIV.

1981 Vaccine Approved

Hepatitis A Vaccination Recommendations

Hepatitis A = Acute viral infection of the liver; spread by person-to-person contact or contaminated food/water

Hepatitis A vaccine is recommended for adults who wish to be vaccinated and adults at increased risk for Hepatitis A infection, including:



Liver disease



HIV



Injection & non-injection drug use



People experiencing homelessness



Men who have sex with men



Risk for exposure via work or other settings



International Travel



Close personal contact with international adoptee

Hepatitis B Vaccine Recommendations

Hepatitis B = Viral liver infection; can cause chronic infections & severe consequences (cirrhosis, liver cancer, etc). Spread by mucosal or percutaneous contact with infectious bodily fluids or blood.

- **Hepatitis B vaccine is now CDC-recommended for all adults 18-59 years**
- For people 60+, HBV vaccine recommended for people at increased risk.



Liver disease



HIV



Injection drug
use



Risk for
exposure to
blood



**Sexual
exposure risk**



Incarcerated

- Anyone aged 60+ years who does not meet risk-based recommendations *may still receive* Hepatitis B vaccination.

Hepatitis B: Who is at risk for sexual exposure?

- **Persons at risk for infection by sexual exposure**
 - Sex partners of persons who test positive for hepatitis B surface antigen (HBsAg)
 - Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the previous 6 months)
 - Persons seeking evaluation or treatment for a sexually transmitted infection
 - Men who have sex with men (MSM)
-

HAV & HBV Vaccine Schedules

HAV Vaccine Options

- **2-dose series:**
 - Havrix, 6–12 months apart
 - Vaqta, 6–18 months apart
- **3-dose series:**
 - Twinrix (Hep A-Hep B combination vaccine) at 0, 1, 6 months

HBV Vaccine Options

- **2-dose series:**
 - Heplisav-B, 1 month apart
- **3-dose series: 0, 1, 6 months apart**
 - Engerix-B
 - Recombivax HB
 - PreHevbrio
 - Twinrix (combination HepA-HepB)

Hepatitis B: Where can they go?

Who: All adults aged 19–59 years and adults ≥ 60 years with risk factors for hepatitis B or without identified risk factors but seeking protection.

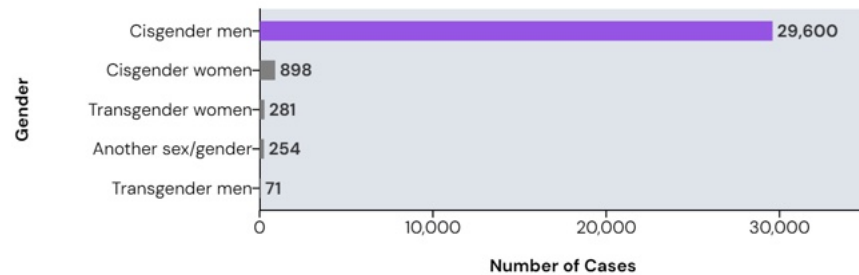
Where: ACIP recommends universal vaccination of adults who receive care in

- sexually transmitted disease treatment facilities,
- HIV testing and treatment facilities,
- facilities providing drug-abuse treatment and prevention services,
- health-care settings targeting services to people who inject drugs,
- correctional facilities,
- health care settings providing services to MSM,
- chronic hemodialysis facilities and end-stage renal disease programs, and
- institutions and nonresidential day care facilities for people with developmental disabilities.

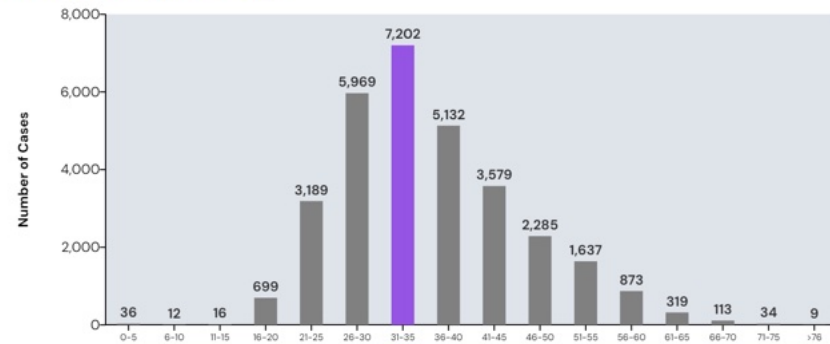
MPX Epidemiology in the United States

- 2022–2023, **31,689 people** diagnosed with mpox and **56 deaths**.

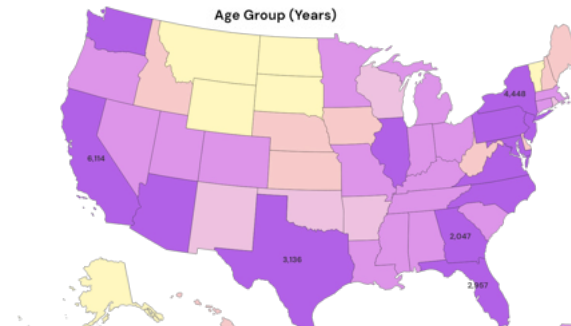
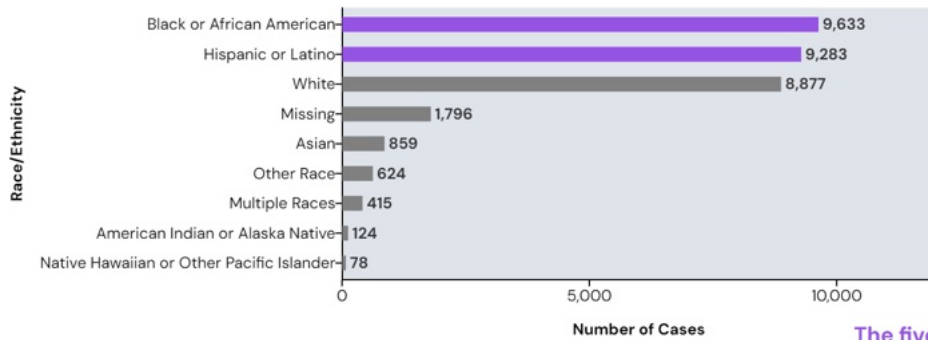
More than 90% of mpox cases have involved cisgender men.



The greatest number of mpox cases have occurred among persons who were 31 to 35 years of age.



The highest number of mpox cases have occurred in Black and Hispanic people.



The five states with the highest number of mpox cases were California, New York, Texas, Florida, and Georgia.

Number of Cases: 1-10, 11-50, 51-100, 101-500, >500

Question: Which vaccines should you recommend for your patient? (select all that apply)

27 year old cis-gender MSM not LWH, seen for routine visit



- A. Hepatitis A
- B. Hepatitis B
- C. HPV
- D. MenACWY
- E. Mpox

Answer: Which vaccines should you recommend?

- A. **Hepatitis A:** Recommended for MSM
- B. **Hepatitis B:** Universal adult recommendation
- C. **HPV:** Recommended for 27-45 yo under shared decision-making
- D. **MenACWY:** Recommended for MSM
- E. **Mpox:** Recommended for people at increased risk

Resources from Sunny California!



Sexual Health Vaccination Provider Job Aids

[Immunization Recommendations for Adults with HIV](#)

[Immunization Recommendations for Gay, Bisexual, and Other Men Who Have Sex With Men](#)

[Immunization Recommendations for Sexually Active People](#)

Sexual Health Vaccination Landing Page:

<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/STI/Sexual-Health-Vaccination.aspx>

Hepatitis A: <https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/STI/Hepatitis-A.aspx>

Hepatitis B: <https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/STI/Hepatitis-B.aspx>

HPV: <https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/STI/Human-Papillomavirus.aspx>

By Disease or Condition

[Immunizations](#)

Alcohol and Drug Use

Smoking and Tobacco Use

Sexual and Reproductive Health

Infectious Diseases

Health Care-Associated Infections

Children and Adolescents

Immigrant Health

Immunizations

Updated recommendations from the NYC Department of Health:

- [General Information for Providers](#)
- [Bureau of Immunization Webinars](#)

Citywide Immunization Registry

To improve the immunization status of all NYC children by consolidating immunization information and sharing it with health care providers, families, and agencies concerned with children's health.

- [Citywide Immunization Registry Information](#)
- [See who is on the Provider Honor Roll](#)

Vaccines for Children Program

The New York City Vaccines for Children (VFC) Program is a federally funded program that supplies providers in private and public health care facilities throughout New York City with free vaccines for eligible children. Besides VFC, additional types of funding may be allocated to cover additional populations.

- [NYC VFC Program Information](#)

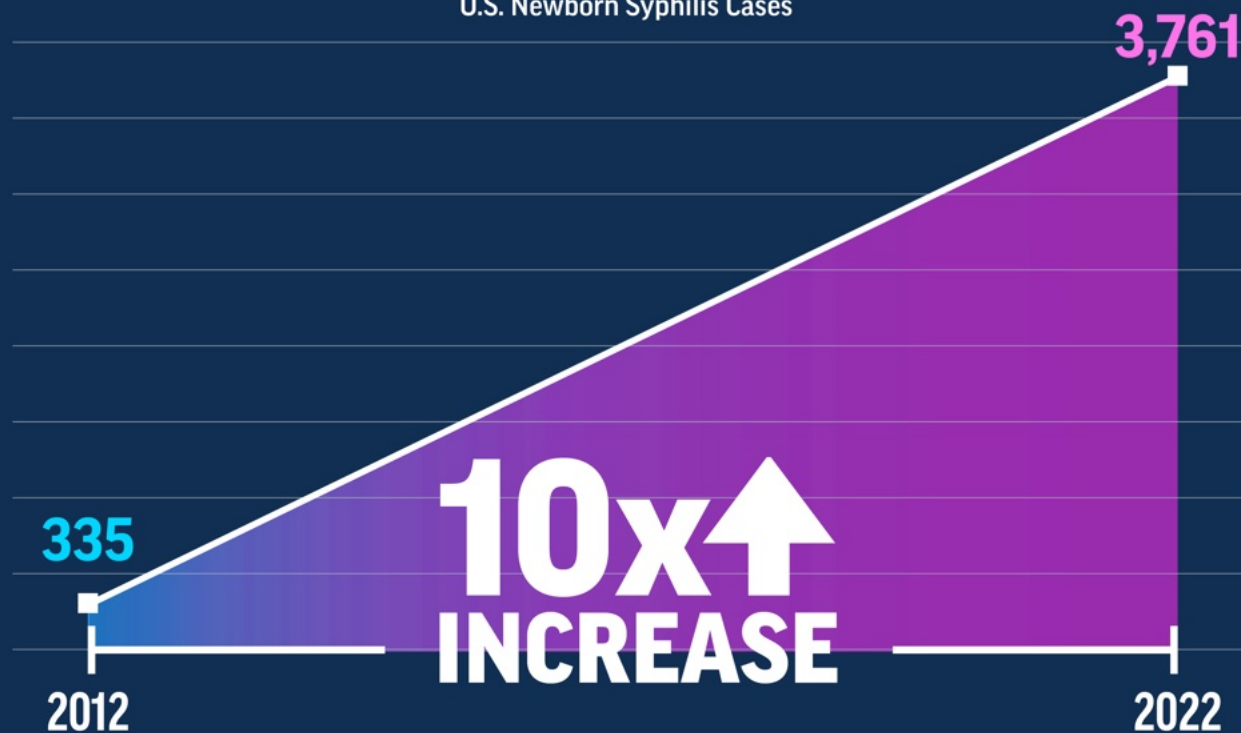
Patient Education Materials

- [Booklet: Parents Informed and Educated](#) (PDF)
- [Health Bulletin: Adult Vaccinations](#)

Immunizations - NYC Health

U.S. Newborn Syphilis Cases Surge Over 10 Years

U.S. Newborn Syphilis Cases



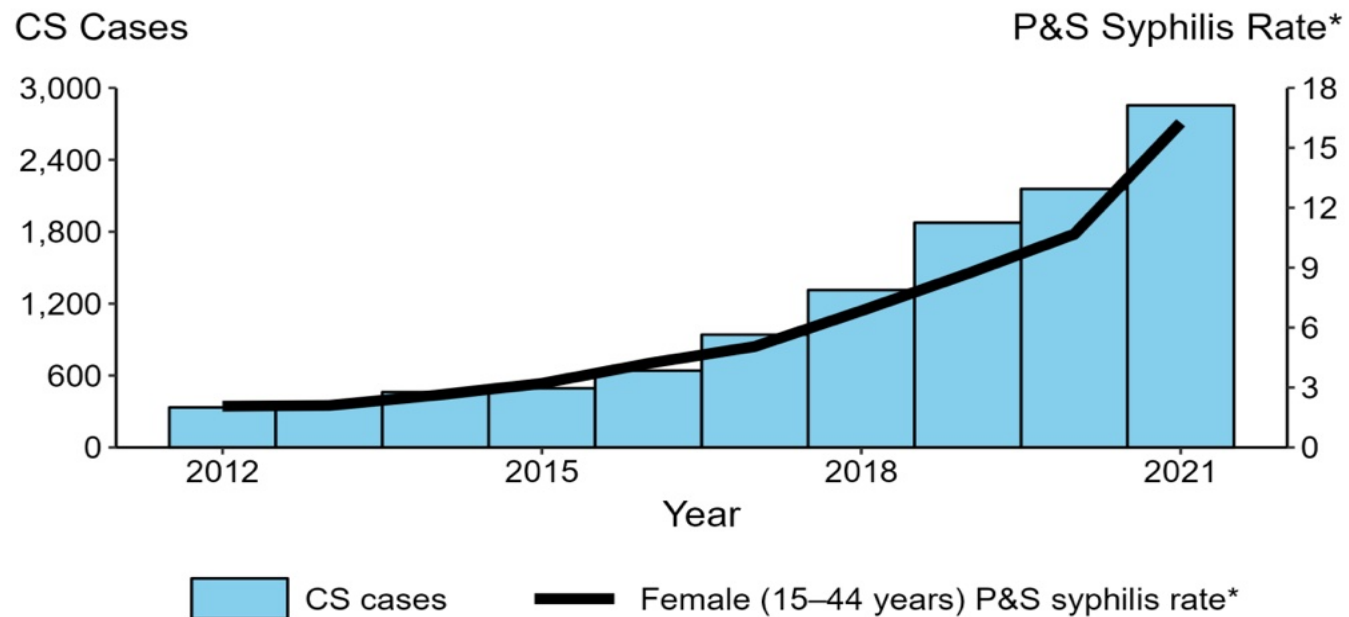
Vital^{CDC}signs™

Source: November 2023 Vital Signs



CS341746

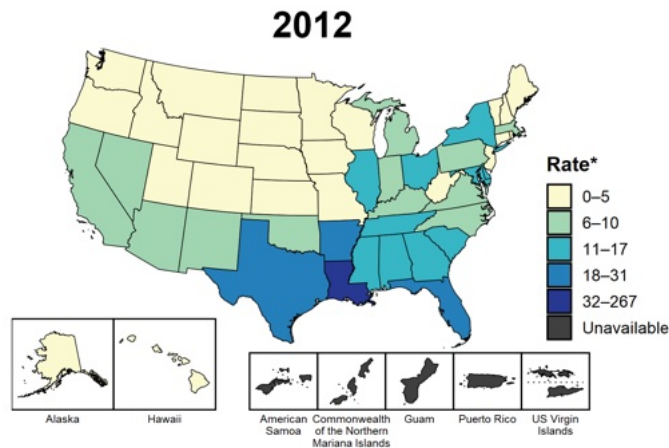
Congenital Syphilis: Reported Cases by Year of Birth and Rates of Reported Cases of Primary and Secondary Syphilis Among Females Aged 15–44 Years, United States, 2010–2021



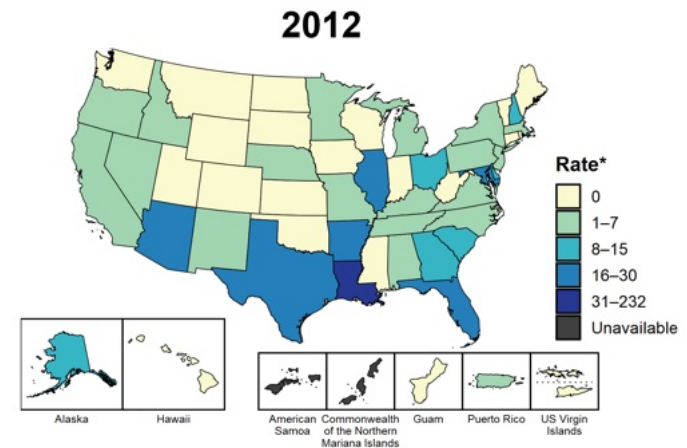
- * Per 100,000
- **ACRONYMS:** CS = Congenital syphilis; P&S = Primary and secondary syphilis

Rates of P&S syphilis among women 15-44 years old versus CS, by State and territories, 2012-2021

P&S Syphilis Rates Among Women 15–44 Years by State, United States and Territories, 2012–2021



Congenital Syphilis Rates by State, United States and Territories, 2012–2021



April 2023: FDA Announces Bicillin L-A Shortage

| Presentation | Availability and Estimated Shortage Duration |
|---|--|
| Bicillin L-A, Injection, 2400000 [iU]/4 mL (NDC 60793-702-10) | Limited Supply. Estimated recovery: December 2024 |

April 2023: FDA Announces Bicillin L-A Shortage

Pfizer Inc. (Revised 05/15/2024)

Company Contact Information:

844-646-4398

| Presentation | Availability and Estimated Shortage Duration | Related Information | Shortage Reason (per FDASIA) |
|---|--|--|------------------------------|
| Bicillin L-A, Injection, 600000 [iU]/1 mL (NDC 60793-700-10) | Unavailable | Next Delivery: February 2025; Estimated Recovery: March 2025 | Demand increase for the drug |
| Bicillin L-A, Injection, 1200000 [iU]/2 mL (NDC 60793-701-10) | Limited Availability | Limited Supply Available. Next Delivery: May 2024; Estimated Recovery: December 2024 | Demand increase for the drug |
| Bicillin L-A, Injection, 2400000 [iU]/4 mL (NDC 60793-702-10) | Limited Availability | Limited Supply Available. Next Delivery: May 2024; Estimated Recovery: December 2024 | Demand increase for the drug |

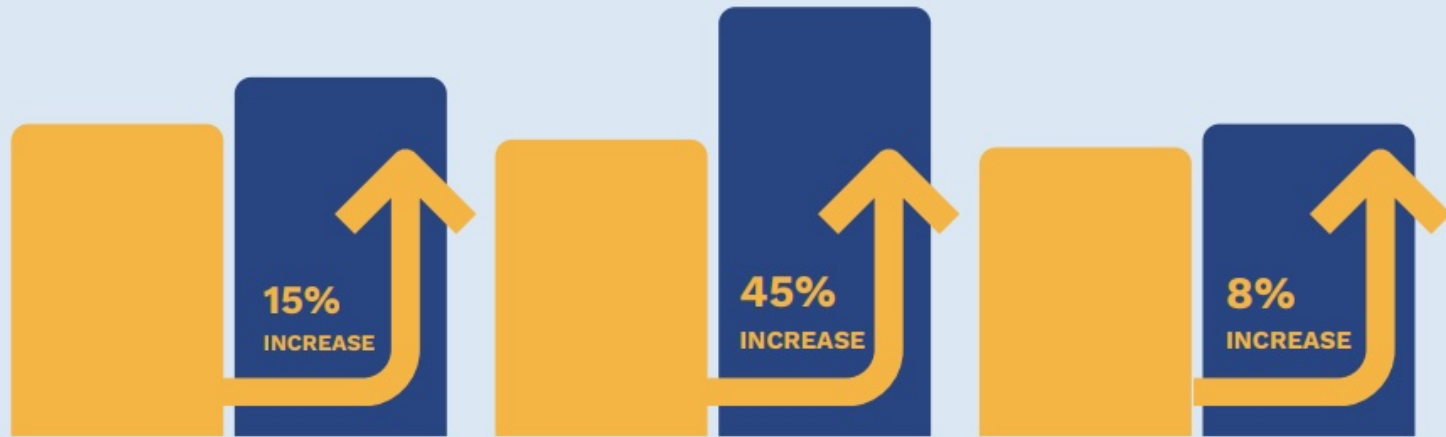
https://www.accessdata.fda.gov/scripts/drugshortages/dsp_ActiveIngredientDetails.cfm?AI=Penicillin%20G%20Benzathine%20Injection&st=c&tab=tabs-1#

**National
Coalition of STD
Directors (NCSD)
2023 Survey:
Increasing
Severity of
Bicillin L-A
Shortage**

151 clinics
136 health
departments
representing 39
states, one
territory, DC,
and
communities
served by IHS

DIFFICULTY ORDERING BICILLIN L-A

■ August ■ November



46% of clinics have attempted to order Bicillin L-A, but the **drug was not available.**

55% of clinics that had **orders completely unfilled** had more than half of their orders unfilled.

40% of clinics have had their **Bicillin L-A orders delayed** in the past three months.

IMPACT ON PREGNANT PEOPLE

In the past three months, health department respondents from 13 different states and one Indian Health Service agency say they've received **reports of a pregnant person in their jurisdiction who was unable to access Bicillin L-A.**

Most respondents were able to confirm that pregnant patients who could not immediately get Bicillin L-A were eventually able to receive treatment.



only 56% could say that treatment was provided **within one week**

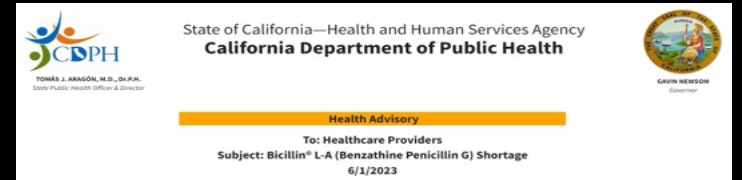


31% said it took **between 8 and 28 days to receive treatment**

Potential Solutions

Bicillin L-A Prioritization Schema

California Dept of Public Health, June 2023




- 1. Prioritize Bicillin® L-A for pregnant people with syphilis infection (or exposure) as well as for infants exposed to syphilis in utero.**
- 2. Prioritize Bicillin® L-A for patients with contraindications to doxycycline** (e.g., anaphylaxis, hemolytic anemia, Stevens Johnson syndrome).
- 3. Conserve Bicillin® L-A by using alternative drugs** for the treatment of infectious diseases (e.g., streptococcal pharyngitis) where oral medications or other effective antimicrobials are available.

<https://www.cdph.ca.gov/Programs/OPA/Pages/CAHAN/Health-Advisory-Bicillin-L-A-Benzathine-Penicillin-G-Shortage.aspx#:~:text=Given%20the%20current%20Bicillin%C2%AE%20L-A%20drug%20shortage%2C%20the,as%20for%20infants%20exposed%E2%80%8B%E2%80%8B%20to%20syphilis%20in%20utero.>

NYC Health Department

Dear Colleague Letter – Bicillin Shortage

- Inventory existing stock of Bicillin L-A.
- Prioritize Bicillin L-A for pregnant patients with syphilis infection or exposure and with a congenital exposure.
- Prioritize Bicillin L-A for patients with contraindications to doxycycline (e.g., anaphylaxis, hemolytic anemia, Stevens Johnson syndrome).
- If Bicillin L-A inventory is low, consider treating non-pregnant adult patients with primary, secondary, or early latent syphilis with doxycycline 100 mg PO BID x 14 days. Strongly consider treating non-pregnant adult patients with late latent syphilis or syphilis of unknown duration with doxycycline 100 mg PO BID x 28 days.
- Avoid using Bicillin L-A for treatment of other infectious diseases (e.g., streptococcal pharyngitis) as alternative oral medications or other effective antimicrobials are available.



NYC HEALTH
NEW YORK CITY DEPARTMENT OF
HEALTH AND MENTAL HYGIENE
Ashwin Vasani, MD, PhD
Commissioner

Long-Acting Penicillin G Benzathine Injectable Suspension Products (Bicillin L-A®) Shortage

- Long-acting penicillin G benzathine injectable suspension products (Bicillin L-A®), the first-line treatment for syphilis and the only recommended treatment for pregnant people and infants with syphilis, continues to be in short supply, with supply shortages likely to continue until mid-2024.
- With rising rates of syphilis and congenital syphilis in New York City (NYC), the NYC Department of Health and Mental Hygiene (NYC Health Department) strongly encourages providers to review their existing Bicillin L-A inventory and reserve Bicillin L-A for pregnant people with syphilis or exposure to syphilis, infants with syphilis, and for people with syphilis who are unable to take doxycycline if their inventory is running low.
- Doxycycline is the acceptable alternative recommendation for people who are not pregnant; providers should closely follow patients to encourage treatment completion.
- Other intramuscular formulations of penicillin, such as Bicillin C-R, are not acceptable alternatives for the treatment of syphilis.

July 10, 2023

Dear Colleague:

- If your institution is experiencing a Bicillin L-A shortage, contact the NYC Health Department by emailing stitraining@health.nyc.gov with the name of your facility and 'Bicillin L-A shortage' in the subject line. We will notify the CDC, which is tracking shortages by jurisdiction.
- Access current and historical syphilis test results and treatment information in the NYC Health Department's [Syphilis Registry](#) to inform diagnosis and management of syphilis in your patients.



CDC Clinical Reminders During Bicillin Shortage

Take inventory:

- Monitor local supply of Bicillin L-A® and [determine the local pattern of use to forecast need](#).
- Contact distributors to procure Bicillin L-A® as appropriate. Contact Pfizer (see [“Dear Patient Letter”](#) posted on the FDA website) if there is less than a 2-week supply, the distributor has no supply, and there is a risk that patients may not be treated.

Appropriately stage syphilis cases to ensure appropriate use of antimicrobials.

Early syphilis (primary, secondary and early latent) only requires 2.4 million units of Bicillin L-A®.

Prioritize using Bicillin L-A® to treat pregnant people with syphilis and babies with congenital syphilis.

- **Choose doxycycline for non-pregnant people to help preserve Bicillin L-A® supplies.**
- Consider involving antimicrobial stewardship leaders to help institute systems-level approaches to limit the use of Bicillin L-A® and encourage the use of alternative effective antimicrobials for treatment of other infectious diseases.

Alternative Treatments for NON-pregnant patients

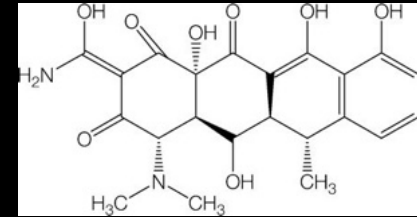
P&S, EARLY LATENT

- Doxycycline 100 mg po bid x 2 weeks (14 days)
- Tetracycline 500 mg po qid x 2 weeks
- Ceftriaxone 1 g IV or IM qd x 10-14 d

LATE-LATENT/ UNKNOWN

- Doxycycline 100 mg po bid x 4 weeks (28 days)
- Tetracycline 500 mg po qid x 4 weeks

Doxycycline

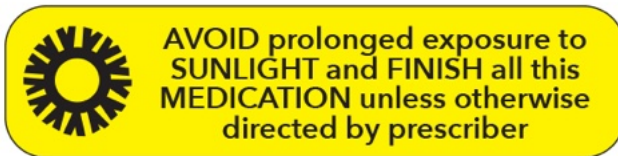
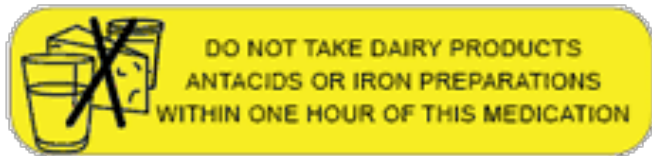


- Protein Synthesis Inhibitor, Approved by the FDA 1967
- Pharmacokinetics:
 - Oral absorption >90% from GI tract
 - Widely distributed: sputum, pleural, synovial, prostatic, seminal fluid, saliva, aqueous humor
 - Poor distribution into CSF
 - 40% of dose gets into breast milk
 - Elimination is mixed renal and fecal
 - With renal impairment, there is ↓ renal elimination, but ↑ GI elimination. No dose adjustment necessary

Patient Education

Adverse Effects

- GI upset/esophageal irritation
- Photosensitivity-wear sunscreen



Patient Counseling

- OK to take with food if GI upset
- Separate with antacids, iron products
- Wear sunscreen

What about breast/chest feeding?

Current labeling includes warning against use in pregnancy, lactation, children < 8 yo due to teeth discoloration, depression of skeletal growth

- “class effect” warning originated with tetracycline (1970)
- Doxycycline GI absorption inhibited by calcium in milk
- Exposure in milk is low:
 - Peak levels 5-7 h after dose
 - Levels typically <1 mg/L
- No reports of bone/teeth adverse events in breast/chest fed babies with doxycycline
- Monitor for diarrhea

Clinical Infectious Diseases 2023;77(8):1120–5

LactMed <https://www.ncbi.nlm.nih.gov/books/NBK500561/> (Accessed Jan 28, 2024)

Audience response question

- *“Our clinic is treating a non-pregnant 28 year-old cis-gender female with doxycycline x 28 days for syphilis of late latent or unknown duration. She has missed two doses. Do I need to start the treatment course over?”*
 - Yes
 - No
 - I don't know
 - It depends

What if my patient forgets to take their doxycycline?

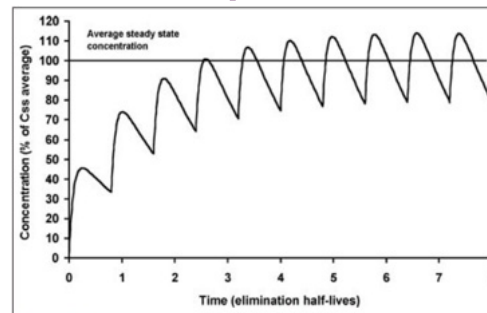
If single dose is missed:

- Take as soon as remember
(don't skip it)
- Don't worry about food/cation interactions at this point
- Don't double up
- Take next dose on time
- Add missed dose at the end

If multiple doses or days:

- How many days of treatment have they had so far?

■ PK Graph:



Considerations:

Takes about 3-4 half-lives to reach steady state;
Doxy half life: 16-22 hours. MIC for *T. pallidum* is low. Doubling time for *T. pallidum* is about 36 h Don't know how much doxycycline we really need

If multiple *early* doses missed, would start over
Later in therapy there is more wiggle room for missed doses (steady state achieved already)


There is no hard and fast rule on what to do

Audience Response Question

- You are treating a 22 year old trans woman for syphilis of late latent/unknown duration. She received her 1st Bicillin L-A injection 7 days ago, but now your clinic has run out of Bicillin. What do you do?
 - A) Give her doxycycline x 7 days
 - B) Give her doxycycline x 14 days
 - C) Give her doxycycline x 28 days


- CDPH Dear Colleague Letter: September, 2023
- No data for mix & match approach
- Safest course = Restart doxy x 28 d

https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Dear-Colleague-Letter_Special-Considerations-for-Treatment-of-Syphilis-Alt-Therapies_9-12-23.pdf



TOMÁS J. ARAGÓN, MD, DPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



GAVIN NEWSOM
Governor

September 12, 2023

Special Considerations for the Treatment of Syphilis using Alternative Therapies in Non-pregnant Persons

Dear Colleague,

In early June, the California Department of Public Health (CDPH) released a [Health Advisory](#) informing providers of **long-acting penicillin G benzathine injectable suspension product (Bicillin® L-A) shortages**, along with acceptable alternatives (e.g., doxycycline), recommendations for Bicillin® L-A prioritization (e.g., pregnant people & infants), and conservation guidance (e.g., non-Bicillin® L-A based antimicrobials for non-syphilis infectious diseases). Regrettably, [updated estimates from the U.S. Food & Drug Administration](#) indicate inadequate Bicillin® L-A supplies at least until the 2nd quarter of 2024 due to increased demand and limited manufacturing capacity.

In the setting of Bicillin® L-A supply shortages, CDPH would like to provide further guidance regarding the use of alternative syphilis treatment regimens for non-pregnant persons in unique situational and clinical case scenarios:

Combining the Use of Bicillin® L-A and Doxycycline:

Late latent syphilis or syphilis of unknown duration

Providers may be compelled to switch non-pregnant patients to doxycycline after receiving their first or second weekly injection (Bicillin® L-A 2.4 mu IM). Currently, there are no data supporting effective combination therapy. **Therefore, when using doxycycline following only one or two injections of Bicillin® L-A in the treatment of late or unknown duration syphilis, the safest and most conservative approach would be:**

- Prescribe **full 28 days of doxycycline 100mg BID** following one or two injections of Bicillin® L-A

CDPH is aware some providers may use less than 28 days of doxycycline after one or two doses of Bicillin® L-A, however currently there are no available data to support the following:

- Prescribing three weeks of doxycycline 100mg BID one week after a single injection of Bicillin® L-A
- Prescribing two weeks of doxycycline 100mg BID one week after two weekly injections of Bicillin® L-A

***If the above regimens are used, CDPH recommends getting more frequent serologies (RPR/VDRL titer) in follow up (i.e., every 3 months).**



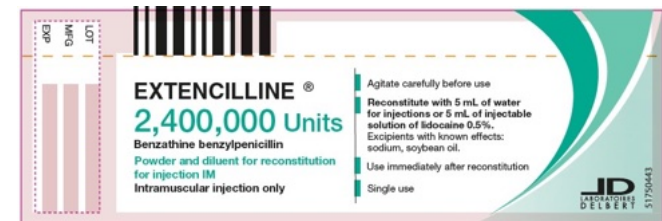
What about Extencilline?

Dear Healthcare Provider Letter (Nov 21, 2023)

Subject:

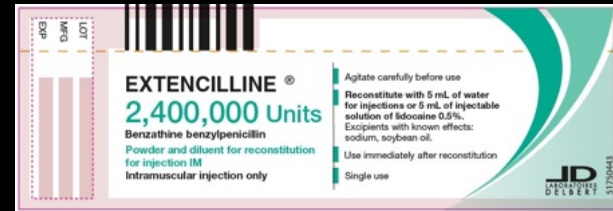
Temporary Importation of Extencilline, (benzathine benzylpenicillin) Powder and diluent for reconstitution for injection, 1,200,000 units and 2,400,000 units with Foreign, non-U.S. Labeling to Address Supply Shortage

- Available to order as of Jan 22, 2024 from Direct Success
- WAC pricing:
 - 1.2 MU vial (NDC 81284-0521-01): \$250.00/vial
 - 2.4 MU vial (NDC 81284-0522-01): \$500.00/vial
- Minimum order: 5 vials
- No 340B pricing



FDA Dear Healthcare Provider Letter <https://www.fda.gov/media/175366/download> (Accessed Jan 25, 2024)

Major differences



Bicillin L-A (benzathine penicillin) [package insert]. Pfizer (Accessed Jan 27, 2024) FDA Dear Healthcare Provider Letter <https://www.fda.gov/media/175366/download> (Accessed Jan 27, 2024)

| | Bicillin-LA | Extencilline |
|----------------------------------|-------------------------------------|---|
| Formulation | pre-filled syringe | powder packaged with SWFI (can be made with 0.5-1% lidocaine) |
| Final volume | 4 ml | 7 ml (will need to be split) |
| Storage | Refrigerated | Room temp |
| Excipients (inactive ingredient) | 0.53% lecithin | lecithin |
| Contraindications | h/o hypersensitivity to penicillins | h/o hypersensitivity to penicillins and soy |

CAUTION: LESS warnings with Extencilline, follow all warnings with Bicillin-LA

What about the soy warning?

Lecithin is a phospholipid derived from soybean oil

- FDA regulations for food and drug labeling are not the same
 - FALCPA and FASTER require food to be labeled with allergy information if they contain any the following 9 allergens:
 - Milk, eggs, fish, Crustacean shellfish, tree nuts, peanuts, wheat, soybeans, sesame
 - No requirement for excipients (inactive ingredient)
- FDA and EMA (European Medicines Agency) rules for labeling are not the same

FALCPA; Food Allergen Labeling and Consumer Protection Act of 2004

FASTER; Food Allergy Safety, Treatment, Education, and Research ACT (2021)

<https://www.fda.gov/food/buy-store-serve-safe-food/food-allergies-what-you-need-know> (Accessed Jan 27, 2024)

<https://www.ema.europa.eu/en/product-information-requirements/excipients-labelling> (Accessed Jan 27, 2024)

What is the risk of hypersensitivity?

- Soy allergy: 0.4% of population; true anaphylaxis very rare
- No “safe” level has been established in people with soy allergy
- Reaction is due to the soy proteins
- Case reports of excipient-associated hypersensitivity reactions to soy have been reported in the literature
 - omeprazole, propofol, inhalers
 - 1 case of papular rash at site of injection of benzathine PCN in an 11 yo allergic to soy in Italy

How many FDA approved products contain lecithin?

The screenshot shows the DailyMed website's advanced search interface. At the top, there is a navigation bar with the NIH logo and 'NATIONAL LIBRARY OF MEDICINE' text, along with links for 'REPORT ADVERSE EVENTS' and 'RECALLS'. Below this is the 'DAILYMED' logo and a navigation menu with links for 'HOME', '+ NEWS', 'FDA RESOURCES', '+ NLM SPL RESOURCES', '+ APPLICATION DEVELOPMENT SUPPORT', and 'HELP'. The main section is titled 'ADVANCED SEARCH' and features a search bar with 'LECITHIN' entered. To the right of the search bar, there are dropdown menus for 'in' and 'Inactive Ingredient', and an 'ADD' button. Below the search bar, there are 'RESET' and 'SEARCH' buttons, and a 'Need help?' link. The footer contains the NIH NLM logo and links for 'About DailyMed', 'Customer Support', 'Copyright', 'Privacy', 'Web Accessibility', and 'HHS Vulnerability Disclosure', along with 'National Institutes of Health', 'National Library of Medicine', and 'Health & Human Services'.

- Search returned **3124 products**
- Includes
 - Cosmetics
 - Topicals
 - IV and PO
 - OTC meds
 - Rx meds

<https://dailymed.nlm.nih.gov/dailymed/index.cfm> (Accessed Jan 28, 2024)

NCSD's Forecaster Tool



National Coalition
of STD Directors

Q Search

Contact

STI INFORMATION & RESOURCES

LEARNING CENTER

ABOUT

OUR WORK

MY NCSD LOGIN

GET INVOLVED

RESOURCES

EVENTS

NEWS & ANNOUNCEMENTS



Home > Resources > Bicillin Forecasting and Inventory

STD RESOURCE

BICILLIN FORECASTING AND INVENTORY

Recently, our field has faced occasional shortages in the supply and availability of Bicillin® L-A for the treatment of syphilis. NCSD is here to help.



https://www.ncsddc.org/resource/bicillin-forecasting-and-inventory/?ACSTrackingID=USDCNPIN_122-DM109263&ACSTrackingLabel=Clinical%20Reminders%20during%20Bicillin%20L-A%C2%AE%20Shortage&deliveryName=USDCNPIN_122-DM109263

New CDC Resource

Extencilline Information for Clinicians



Extencilline (benzathine benzylpenicillin)

What is Extencilline?

Extencilline is benzathine benzylpenicillin (penicillin G benzathine) injection powder for suspension that is being temporarily imported to address [ongoing shortages of Bicillin® L-A](#) (penicillin G benzathine injectable suspension) in the United States.

In what form is Extencilline available?

Extencilline (benzathine benzylpenicillin) is a powder and diluent for reconstitution for injection of 1,200,000 units and 2,400,000 units.

How to prepare Extencilline

- With a graduated syringe for intramuscular injection (needle gauge: 22, 21, or 20), take 4 mL of sterile water for injection from the ampule of diluent contained in the box. Note that the ampule of diluent provided in the box contains 5 mL of sterile water for injection; **only 4 mL of diluent** is needed for the preparation of this 1,200,000 unit suspension. 4 mL of 1% or 0.5% lidocaine injectable solution may also be used as the diluent instead of water.
- 2. Into the vial of powder of 1,200,000 units, add the 4 mL of sterile water for injection taken from the ampule of diluent, or add the 4 mL of 1% or 0.5% lidocaine injectable solution.
- 3. Gently shake this suspension for at least 20 seconds until a homogenous suspension is obtained. Withdraw the entire contents of the vial into the syringe to equal the total labeled dose. Use the suspension immediately as soon as it is prepared.
- 4. After reconstitution with 4 mL of diluent, each 5 mL suspension will contain approximately 1,200,000 units of benzathine benzylpenicillin.

Alternative Doses of Extencilline

- **For doses of Extencilline less than 1,200,000 units:** withdraw the appropriate volume of the reconstituted product and discard the remainder. For example, to obtain a dose of 600,000 units of Extencilline, withdraw half the volume of the reconstituted 1,200,000 unit product, then discard the remainder.
- **When preparing an intramuscular injection of a dose of 2,400,000 units:** follow the identical instructions as with 1,200,000 units but use **5 mL of diluent** (water or lidocaine). After reconstitution with 5 mL of diluent, each 7 mL suspension will contain approximately 2,400,000 units. This reconstitution must be given as two separate injections of 3.5 mL each.

| ▪ Vial Dosage | Amount of Diluent to Be Added | Final Concentration |
|-------------------|-------------------------------|-------------------------------------|
| ▪ 1,200,000 units | 4 mL | 1,200,000 units per 5 mL suspension |
| ▪ 2,400,000 units | 5 mL | 2,400,000 units per 7 mL suspension |

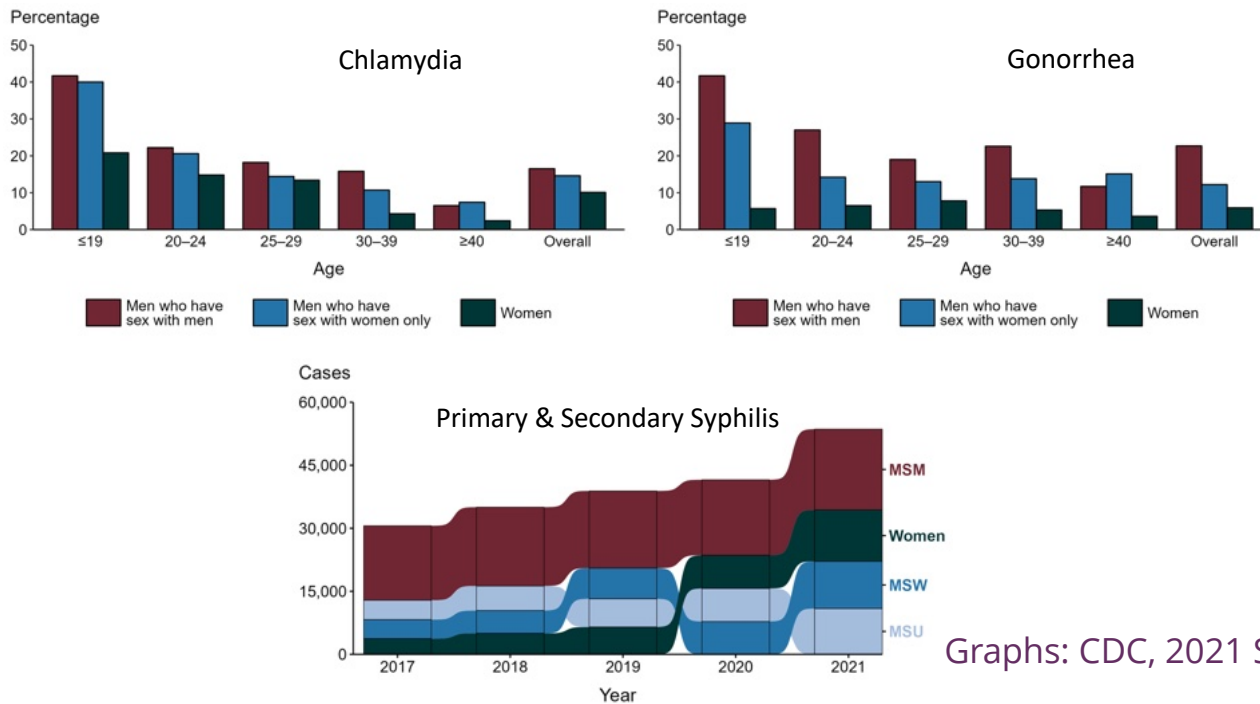
Administration

- The preparation is strictly for deep intramuscular injection only. Administration is similar to Bicillin® L-A.
- Inspect visually for particulate matter and discoloration prior to administration.
- **Do not inject intravenously or mix with other intravenous solutions** since this has been associated with cardiorespiratory arrest and death.
- **Administer into the upper, outer quadrant of the buttock (dorsogluteal) or the ventrogluteal site;** in neonates, infants, and small children it may be preferable to administer in the midlateral aspect of the thigh.
- Do not inject into or near an artery or nerve. Do not inject into the anterolateral thigh as quadriceps femoris fibrosis and atrophy have been reported. **Do not inject into the arm.**
- Due to the high concentration of suspended material in this product, to avoid blockage of the needle, **administer at a slow, steady rate.**
- When doses are repeated, **vary the injection site.**
- If any discoloration appears upon insertion of the needle and aspiration, withdraw the needle and discard.



Doxycycline for bacterial STI prevention (Doxy PEP)

2021 Surveillance Data: Global STI Epidemic Continues to Disproportionately Impact MSM



Graphs: CDC, 2021 Surveillance Report

Doxycycline Post-Exposure Prophylaxis (Doxy-PEP)

One-time, 200 mg tablet of **Doxycycline**, an antibiotic, taken within 72 hours *after* having oral, anal, or insertive vaginal sex when not using a condom, to reduce infections of gonorrhea (GC), chlamydia (CT), & syphilis.

“Plan B” or “Morning After Pill” for bacterial STIs

Slide adapted from: K. Mohr, CA Dept of Public Health

Doxy-PEP Data

Ipergay

- Open label RCT 1:1
- PEP vs no PEP
- Substudy of **232 MSM** in large PrEP 2-1-1 trial

- **CT: 70% reduction**
- **Syphilis: 73% reduction**
- **GC: Not effective**
 - TCN resistance

Molina et al 2018

DoxyVac

- Open label RCT 2:1
- PEP vs no PEP
- **502 MSM** on HIV PrEP w/ bacterial STI in past 12 months

- **CT: 89% reduction**
- **Syphilis: 84% reduction**
- **GC: 51% reduction**

Molina et al 2023

DOXYPEP

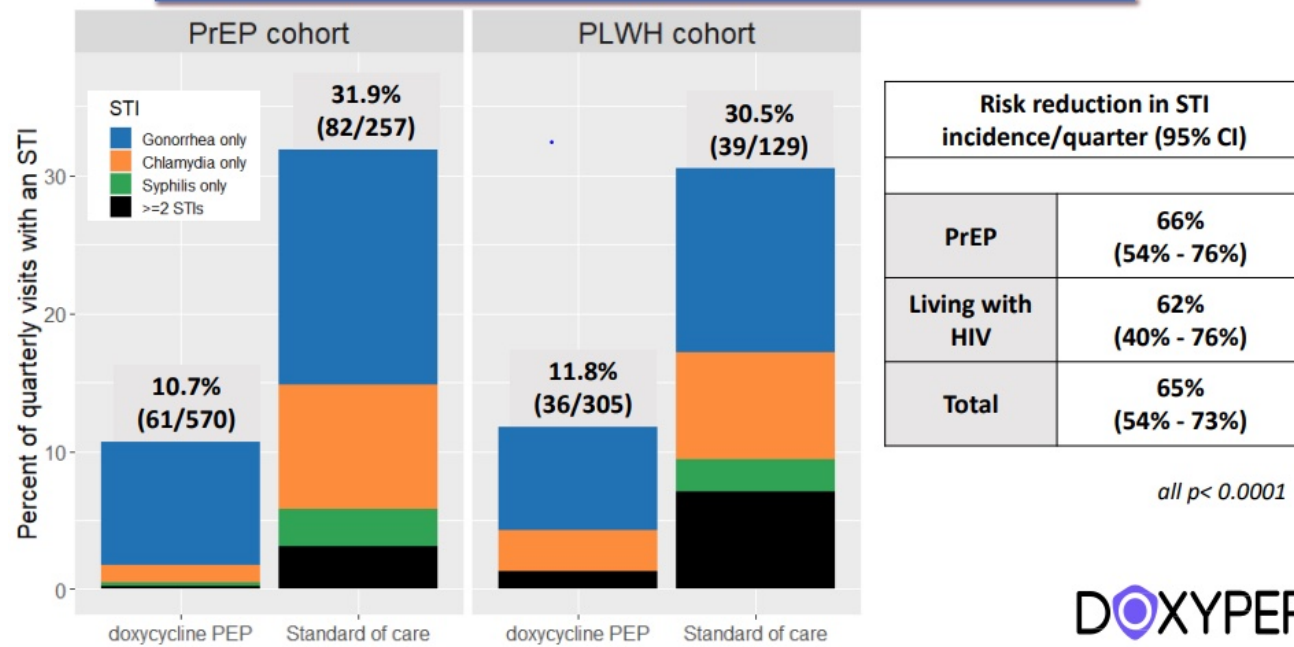
- Open label RCT 2:1
- PEP vs no PEP
- **501 MSM/TGW** on HIV PrEP or LWH w/ bacterial STI in past 12 months

- **CT: 74%, 88% reduction**
- **Syphilis: 77%, 87% reduction**
- **GC: 57%, 55% reduction**

Leutkemeyer, et al 2023

Doxy-PEP: Decreased all 3 bacterial STIs in both cohorts

Primary Endpoint: STI incidence per quarter



DOXYPEP

Slide credit: DOXYPEP study

DOXYPEP: No Change in Sexual Behavior & High Adherence

- **Sexual behavior @ enrollment:** Median of 9 sexual partners in last 3 months with 5 sex acts/month; 90.1% condomless sex
- **Sexual behavior @ follow-up: On study, no significant changes in:**
 - # sex partners in doxy PEP group
 - # condomless anal, oral, and vaginal/front hole sex acts in doxy-PEP group
 - Differences in # partners or # condomless sex act between doxyPEP & SOC arms
- **Adherence (self-report):**
 - 85% reported doxy PEP use always/often after anal/vaginal sex
 - Median doxyPEP doses: 4.0/month (IQR 1-10), 25% with 10+ doses/month, based on quarterly interview

Slide adapted from: DOXYPEP study

Doxy PEP for Cisgender Women

Stewart J et al. *Doxycycline postexposure prophylaxis for prevention of STIs among cisgender women.*

30th Conference on Retroviruses and Opportunistic Infections, Seattle, abstract 121, 2023

Methods: doxy-PEP vs Standard of Care among Women

Design: Open-label randomized trial

- 200 mg doxy (w/in 72 hours of sex) vs standard of care (quarterly STI screening/treatment)

Study Population: 449 18-30 yr women – Kisumu Kenya

- All pts taking daily oral HIV PrEP
- Contraception not required (doxy stopped if pregnancy occurred)

Adherence:

- Weekly SMS surveys to assess doxy use w/sex

Endpoint: Incident CT, GC, or syphilis infection

- Measured quarterly x 1 year, at study visits q3 months

Slide adapted from: K. Johnson, CAPTC

Doxy-PEP Results: No difference in incident STIs by study group

- Overall: Incident STIs detected @ 109 follow-up visits (85 CT, 31 GC – including 8 co-infections w/CT, 1 syphilis)
 - **50 STIs in doxyPEP group vs 59 STIs in SOC group; no significant difference**
 - RR 0.88 (95% CI 0.60-1.29; p=0.51)
- Findings unchanged in additional analyses
 - Censoring follow-up time for pregnancy (n=80)
 - Analysis of each STI separately
 - Subgroup analyses (by age, contraception use, transactional sex, STIs at baseline)
- No serious AEs; no incident HIV infections

Slide adapted from: K. Johnson, CAPTC

dPEP: Adherence data

Self reported adherence

- Weekly SMS
 - 78% of participants reported taking doxy as many days as they had sex

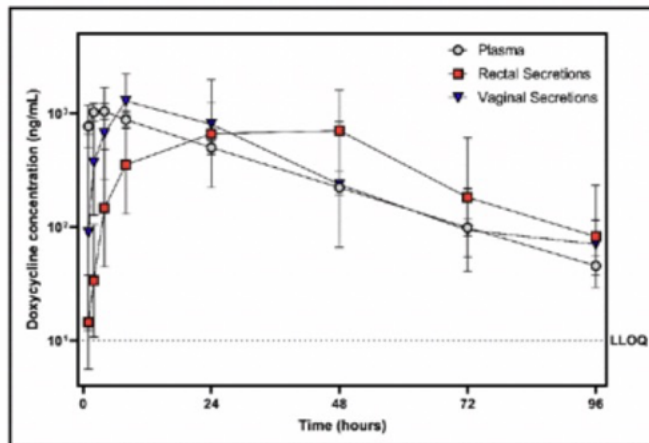
Hair sampling analysis

- Random subset of 50 participants
 - 44% in PEP group never had doxycycline detected

“Differing results between trials among MSM and this trial among cisgender women are likely explained by low use of doxycycline PEP.”

Doxy availability: same in vaginal and rectal secretions

Mucosal Doxycycline Concentrations



| | C_{max} (ng/mL) [95% CI] | T_{max} | AUC_{0-96h} (ng*h/mL) [95% CI] | AUC Ratio (S:P) |
|-----------------------|----------------------------------|-----------|--|-----------------------|
| Plasma | 1042 [889 – 1222] | 4 hr | 33,951 [29,632 – 38,899] | |
| Rectal Secretions | 704 [311 – 1596] | 48 hr | 73,511 [34,332 – 156,487] | 2.17 |
| Vaginal Secretions | 1284 [742 – 2223] | 8 hr | 58,562 [32,719 – 104,816] | 1.72 |

- Doxycycline concentrations peak later in rectal secretions than plasma
- Rectal and vaginal doxycycline exposure greater in mucosa than plasma

Doxy concentrations in cervicovaginal and urethral tissue are above what's necessary to inhibit bacterial STIs

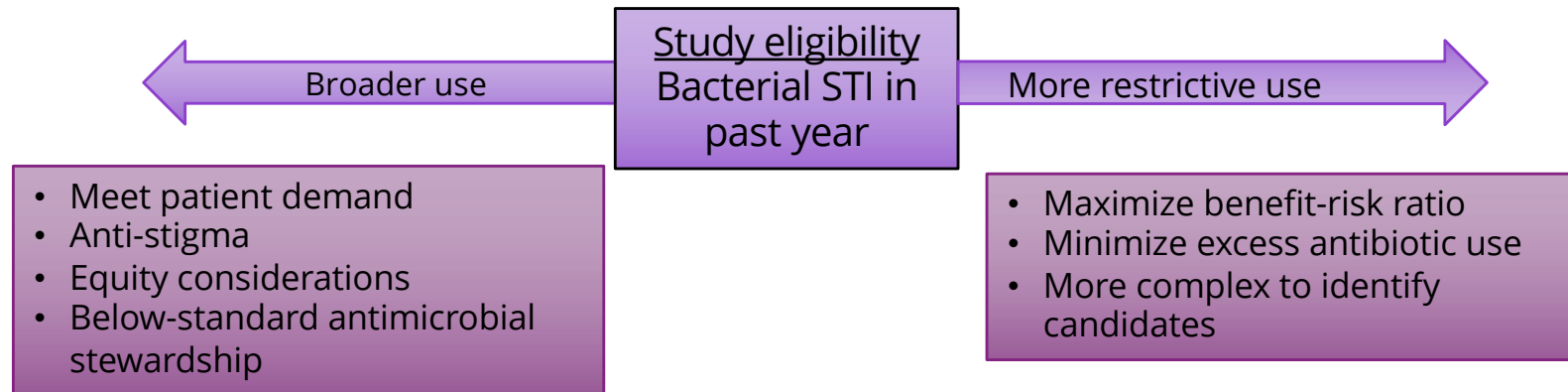
Tissue and Urethral Doxycycline Concentrations

| | C ₂₄ (ng/g or ng/mL) [95% CI] | Fold above MIC | | |
|------------------------|---|----------------------|-------------------|----------------------|
| | | <i>C trachomatis</i> | <i>T pallidum</i> | <i>N gonorrhoeae</i> |
| Rectal Tissue | 616 [495 – 766] | 9x | 6x | 2x |
| Vaginal Tissue | 301 [130 – 698] | 4x | 3x | 1x |
| Cervical Tissue | 430 [220 – 840] | 6x | 4x | 1x |
| Urethral Secretions | 1166 [598 – 2394] | 18x | 11x | 4x |

- Tissue concentrations 24 hours after dose reach up to 9x MIC values
- Doxycycline detected on 9/11 male urethral swabs
 - Concentrations exceed 4x MIC values

Minimum Inhibitory Concentrations (MIC): Zheng *Sex Transm Dis* 2015; Edmondson *Antimicrob Agents Chemother* 2020; CDC Antimicrob Resist Susc Test

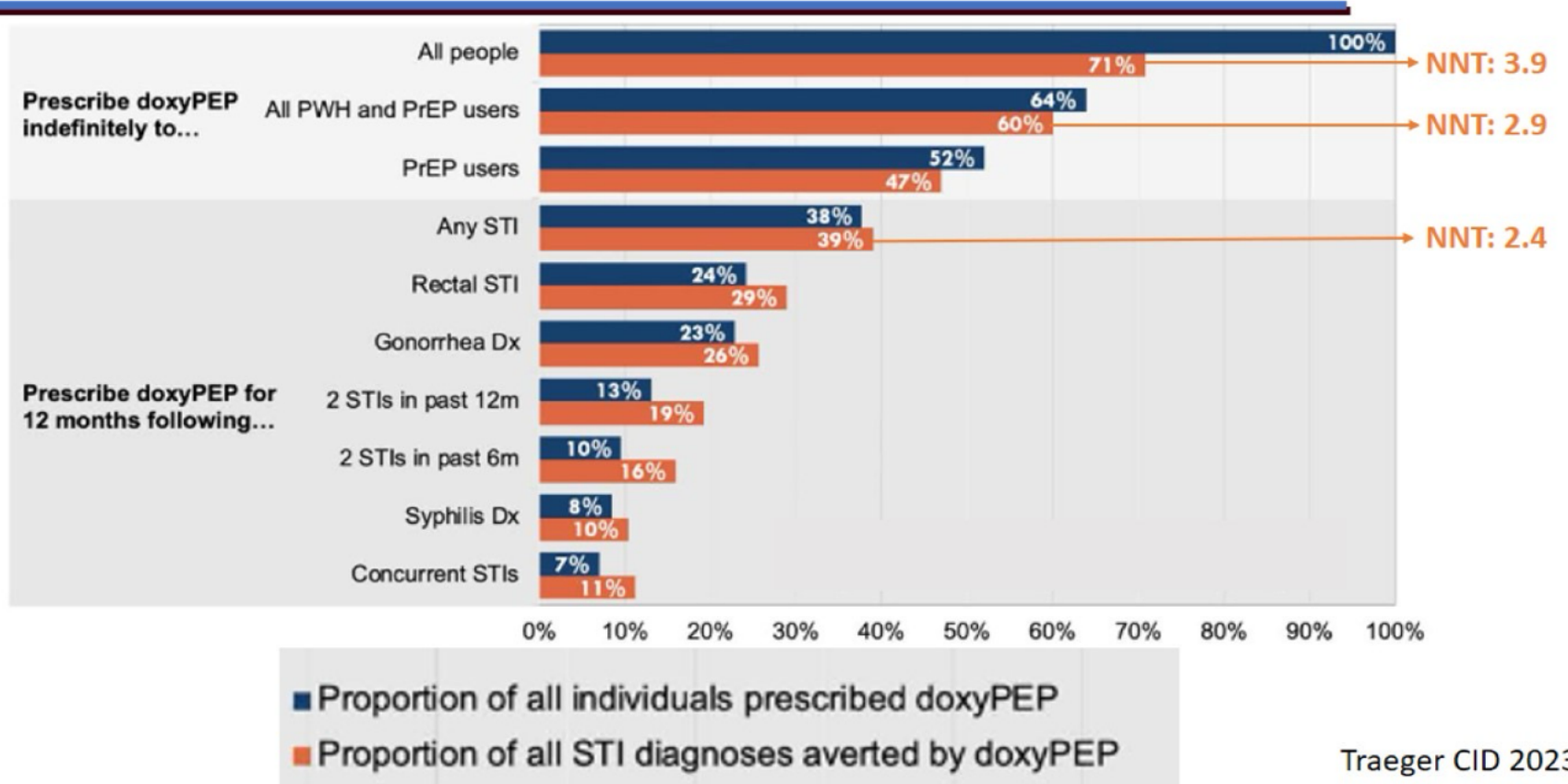
Who Should be Offered doxy-PEP?



- Without a proactive approach, we risk worsening disparities
- Need to generate evidence to guide the approach (but not wait for it)
- Need to tailor to local epidemiology & resources

Slide adapted from: S. Cohen, SF City Clinic

Targeted delivery of doxy-PEP: STIs averted in Fenway cohort with different subgroups



Strut Clinic- San Francisco AIDS Foundation

≈ 1775 on doxy-PEP by 7/2023



Decline in GC/CT among PrEP Clients w/ DoxyPEP*

| PrEP Clients | | | | |
|------------------------|-------------|----------------|---------------|--------|
| | Non-DoxyPEP | Before DoxyPEP | After DoxyPEP | Total |
| Chlamydia Tests | | | | |
| Indeterminate | 3 | 5 | 1 | 9 |
| Negative | 12,924 | 5,927 | 3,283 | 22,134 |
| Positive | 262 | 348 | 32 | 642 |
| Total | 13,189 | 6,280 | 3,316 | 22,785 |
| Positivity | 2.0% | 5.5% | 1.0% | 2.8% |
| Gonorrhea Tests | | | | |
| Indeterminate | 14 | 8 | 6 | 28 |
| Negative | 12,804 | 5,852 | 3171 | 21,827 |
| Positive | 371 | 421 | 146 | 938 |
| Total | 13,189 | 6,281 | 3,323 | 22,793 |
| Positivity | 2.8% | 6.7% | 4.4% | 4.1% |

Scott, 2023 ISSTD

Slide 43

*Only clients on DoxPEP for 90 days or more

San Francisco City Clinic

≈ 828 on doxy-PEP by 6/2023

Uptake

- ≥1 sexual partners prior 3 months & ≥1 STI in prior year (GC,CT or syphilis): **74%**
- ≥2 sexual partners and no STI in prior year: **60%**

Increased uptake in each tier with the number of recent sexual partners

- No disparities thus far in doxy-PEP uptake by race/ethnicity or age
- Frequency of use similar to DoxyPEP RCT (4x-6x/month)
- People are using it "selectively" - after some encounters but not all

Bacon, 2023 ISSTD

Slide credit: A. Leutkemeyer, UCSF

How to prescribe doxy PEP

- Doxycycline (hyclate or monohydrate) immediate release 100 mg pills
 - (Or delayed release doxycycline hyclate 200mg pills but more expensive)
- 2 tabs by mouth within 24 hours of condomless sexual exposure; can be taken up to 72 hours after sex
- Not to exceed one dose daily
- # 30 doses (60 pills)
- Screen: GC/ CT/ Syphilis/ HIV q 3 months for now
- Labs: not necessary unless known liver disease; could consider annual check
- Consider not treating those using doxy PEP without a positive GC/CT lab result (i.e., exposures)
- Unknown impact on syphilis serologies
- ICD-10 code Z20.2

NYC Doxy PEP resources

NYC Health NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE
Ashwin Vasani, MD, PhD
Commissioner

Doxycycline Post-Exposure Prophylaxis (Doxy-PEP) to Prevent Bacterial Sexually Transmitted Infections

- Doxycycline 200 mg administered within 24-72 hours of condomless sex (doxy-PEP) has been shown in studies to reduce the incidence of syphilis, chlamydia, and gonorrhea among cisgender men who have sex with men (MSM) and transgender women with a recent history of these infections.
- With rising rates of sexually transmitted infections (STIs) in New York City (NYC), the NYC Department of Health and Mental Hygiene (NYC Health Department) strongly encourages providers to consider prescribing doxy-PEP to cisgender MSM and transgender women who have sex with men and who have a history of chlamydia, gonorrhea, or syphilis in the prior year, based on shared decision-making with the patient.
- Providers should present information on the effectiveness, benefits, and risks of doxy-PEP, as well as other options available to prevent STIs.

November 9, 2023

Dear Colleagues,

[dear-colleague-doxy-PEP-to-prevent-bacterial-STI-11092023.pdf \(nyc.gov\)](https://www.nyc.gov/assets/doh/downloads/pdf/std/dear-colleague-doxy-PEP-to-prevent-bacterial-STI-11092023.pdf)

Recommendations for Health Care Providers

- **Take a comprehensive sexual history** as part of routine care for all patients to elicit information most useful for identifying an appropriate clinical course of action.¹¹
- Prescribe doxy-PEP based on **shared decision-making** with the patient; provide information on its effectiveness and potential benefits and risks, as well as other options available to prevent STIs.
- Give particular consideration to prescribing doxy-PEP to **MSM and transgender women with a history of bacterial STIs in the prior year**, especially those with a history of syphilis or multiple STIs.
 - Doxy-PEP is **not recommended for cisgender women** given the lack of sufficient trial data.
 - **Transgender men and gender-diverse patients assigned female sex at birth were not included in prior studies**, and the potential benefits and risks of doxy-PEP for them are unknown.
- Consider prescribing doxy-PEP on an **episodic basis** for patients who anticipate periods when their STI risk may be higher (e.g., attendance at group sex events).

How To Take Doxy PEP

Taking Doxy PEP (the antibiotic doxycycline) after condomless sex — oral, anal or vaginal/front-hole sex when a condom is not used for the entire time — lowers your chance of getting syphilis, gonorrhea and chlamydia.

Doxy PEP works best if taken within 24 hours of condomless sex.

Sex daily (or more)
Take two 100-milligram (mg) pills of doxycycline within 24 hours (and no later than 72 hours) after condomless sex.

Take doxycycline as often as every day when having condomless sex but **do not take more than 200 mg (two 100 mg pills) in a 24-hour period.**

Take the last dose at least 24 hours after the previous one and within 72 hours of the last time you had condomless sex.

Take two pills after sex

For up-to-date information on Sexual Health Clinic services, locations and hours, scan the QR code, call 311 or visit [nyc.gov/health/sexualhealthclinics](https://www.nyc.gov/health/sexualhealthclinics). To make an Express Clinic appointment for STI rapid testing, visit [nyc.gov/health/sexualhealthclinics](https://www.nyc.gov/health/sexualhealthclinics). For telemedicine services related to HIV, STI, contraception and medication abortion, call the Sexual Health Clinic hotline at 347-396-7959, Monday to Friday, 9 a.m. to 3:30 p.m.

Adapted and used with permission from the San Francisco Department of Public Health.

<https://www.nyc.gov/assets/doh/downloads/pdf/std/how-to-take-doxy-pep.pdf>

NYC Health

About Doxy PEP

What is doxy PEP?
Doxy PEP means taking the antibiotic doxycycline after sex to prevent getting certain sexually transmitted infections (STIs). It is like a morning-after pill but for STIs. Taking doxy PEP lowers your chance of getting syphilis, gonorrhea and chlamydia by about two-thirds.

When should I take doxy PEP?
Doxy PEP works best when taken within 24 hours of condomless sex. Take two 100 milligram (mg) pills of doxycycline within 24 hours (or no later than 72 hours) after condomless sex. Condomless sex means oral, anal or vaginal (front-hole) sex when a condom is not used the entire time.

What if I have sex again within 24 hours after taking doxy PEP?
If you have sex again within 24 hours after taking doxycycline, take another dose (two 100 mg pills) 24 hours after your last dose. Take doxycycline as often as every day when having condomless sex but do not take more than 200 mg (two 100 mg pills) in a 24-hour period.

How should I take doxy PEP?


- Take doxycycline with **plenty** of water or another drink so that doxycycline is easier to swallow. If your stomach is upset by doxycycline, taking it with food may help.
- When taking doxycycline, some people become more sensitive to the sun, so use sunscreen or cover exposed skin when outdoors.
- Avoid taking antacids, multivitamins and supplements containing calcium, magnesium or iron two hours before or after taking doxycycline because it may stop your body from absorbing the antibiotic.

<https://www.nyc.gov/assets/doh/downloads/pdf/std/doxy-pep-one-pager.pdf>

Doxy PEP patient education

Doxy PEP – How to Take

Two 100 mg pills of doxycycline ideally within 24 hours but no later than 72 hours after condomless oral, anal or vaginal sex

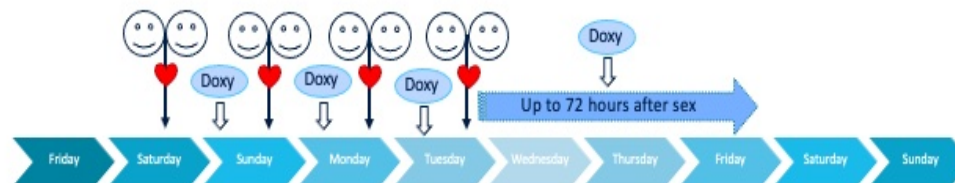
 = sex without a condom, including oral sex

Example: Sex on Sat; take dose of doxy by Tues

Example: Sex on Thursday; take dose of doxy by Sunday



Example 2: Daily (or more) sex Sat-Tues; take daily dose of doxy and last dose within 24 hours *but not later than 72 hours* after last sex



No more than 200 mg every 24 hours

Slide credit: S. Cohen, SF City Clinic

Doxy PEP patient education

About Doxy-PEP



What is doxy-PEP?

- Doxy-PEP means taking the antibiotic doxycycline after sex, to prevent getting an STI. It is like a morning-after pill but for STIs. Taking doxy-PEP reduces your chance of acquiring syphilis, gonorrhea, and chlamydia by about two-thirds.



When should I take doxy-PEP?

- Two 100 mg pills of doxycycline should be taken ideally within 24 hours but no later than 72 hours after condomless sex. Condomless sex means oral, anal or vaginal/front-hole sex where a condom isn't used for the entire time.

What about when I have sex again?

- If you have sex again within 24 hours of taking doxycycline, take another dose 24 hours after your last dose. You can take doxycycline as often as every day when you are having condomless sex but don't take more than 200 mg (two 100 mg pills) every 24 hours.



How should I take doxy-PEP?

- Take doxycycline with plenty of water or something else to drink so that it does not get stuck when you swallow. If your stomach is upset by doxycycline, taking it with food may help.
- Some people are more sensitive to the sun when they take doxycycline, so wear sunscreen.
- Please do not share doxycycline with others.
- Avoid dairy products, calcium, antacids, or multivitamins 2 hours before after taking doxycycline.



Doxy PEP patient education

About Doxy-PEP



What are we still learning about doxy-PEP?

- Does it affect normal (“good”) bacteria in our intestines?
- Could it increase or decrease the bacteria that live on our skin, or make them resistant to doxycycline (for example staph)?
- Will doxy-PEP increase doxycycline resistance in bacteria that cause STIs?
 - Although doxycycline has been used for decades, there is not resistance to doxycycline in chlamydia or syphilis.
 - About 25% of gonorrhea in the US is already resistant to doxy; doxy-PEP may not work against these strains. The DoxyPEP study and other studies will help understand whether using doxy-PEP changes resistance in gonorrhea.



Reminders

- Call us at 628-217-6692 if you run out of doxycycline, if you are having any side effects, or if you think you may have an STI.
- Please continue to get tested for STIs every 3 months and whenever you have symptoms.
- Doxy-PEP doesn’t protect against MPX (monkeypox), HIV, or other viral infections



Doxy PEP implementation resources

STD RESOURCE

DOXY AS STI PEP COMMAND CENTER

Your hub for tools, templates, model policies, and an implementation toolkit to begin offering doxycycline as STI PEP to patients in your community.

<https://www.ncsddc.org/resource/doxy-as-sti-pep-command-center/>



<https://www.sfcityclinic.org/providers/guidelines/hiv-and-sti-prevention>



<https://kingcounty.gov/en/legacy/depts/health/communicable-diseases/hiv-std.aspx>

What we know

Slide credit: A. Leutkemeyer, UCSF

DoxyPEP works very well to prevent STI's in MSM with consistent results in two RCTs

↓ *Each* bacterial STI including gonorrhea

DoxyPEP : Need to treat about **5 people** to prevent a quarter with an STI, in a population with a high STI incidence (30% per quarter)

Safe & well tolerated

Low adherence in cis-gender women may explain lack of efficacy- need more data in this population

What we are still learning

How well does a person have to take doxyPEP to be protected?

What about potential for changes in sexual behavior, now that it is known to be efficacious?

Antimicrobial resistance Impact:

-> TCN-resistant GC impact on doxy-PEP efficacy

-> Longer term impact on bystander bacteria like *Staph aureus*, and the gut microbiome

-> Impact on other STIs: CT, Syphilis, *M. gen*

Efficacy & risk/benefit ratio in men who have sex with women and cis-women

Real world implementation & Impact on STIs incidence

Slide credit: A. Leutkemeyer, UCSF

Slide 40

Doxy PEP as part of a comprehensive package of sexual health services



Slide credit: S. Cohen, SF City Clinic



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DOXYPEP

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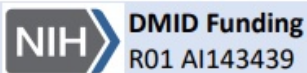
With profound thanks to our study participants for their time & commitment

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THANK YOU!

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Have Questions?

STD Clinical Consultation Network

www.stdccn.org

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Thank You for Your Attendance!

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