



# Doxycycline Post-Exposure Prophylaxis (DoxyPEP) for Bacterial STIs



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# Conflict of interest

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- None relevant
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# Outline

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- What is DoxyPEP?
  - Why DoxyPEP?
  - Benefits of DoxyPEP?
  - Harms/adverse effects and unknowns
-



# What is DoxyPEP?

- Idea of taking a medication after an exposure (post-exposure) to prevent an infection is not new
  - E.g. DoxyPEP for Lyme disease after a tick bite
  - E.g. Rabies shot after an animal bite



**DoxyPEP for Bacterial STIs:** Taking a single 200mg dose of Doxycycline antibiotic *after* an unprotected sexual intercourse, within 72hrs, to prevent *bacterial STIs*



# Outline

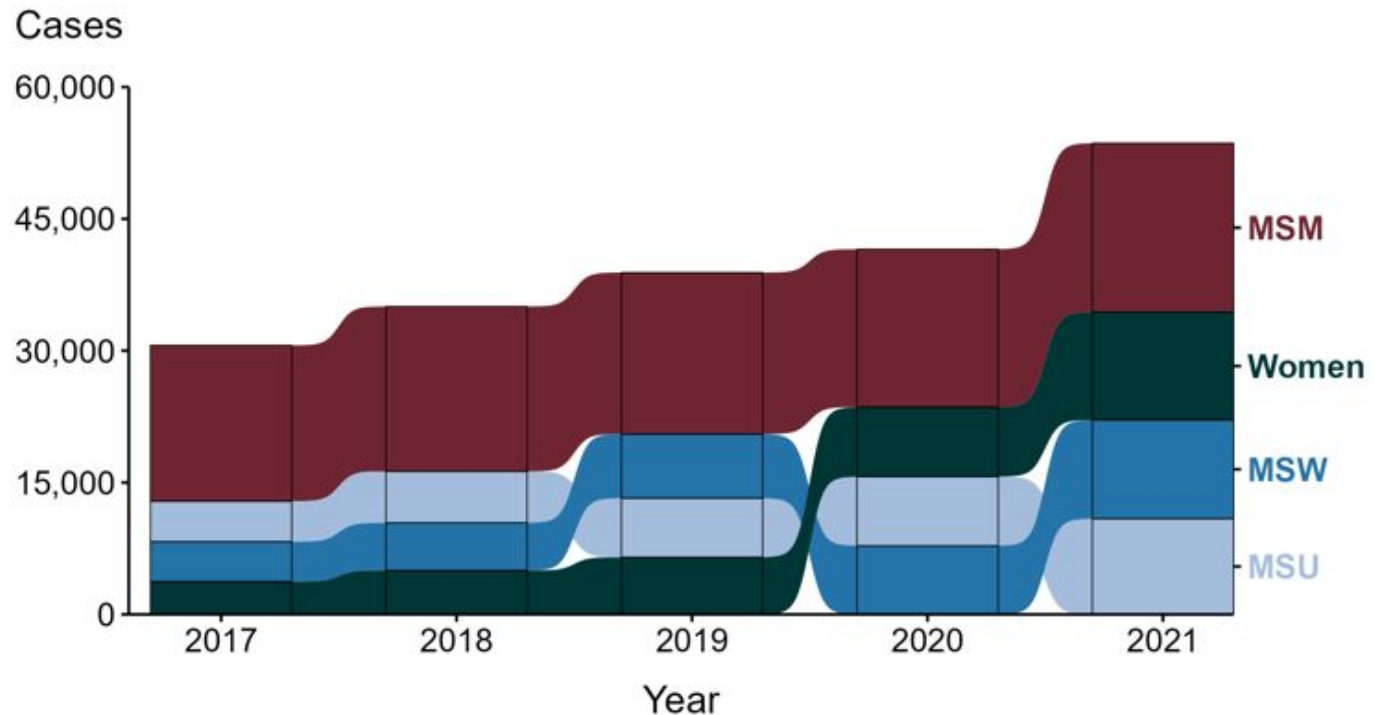
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- What is DoxyPEP?
  - **Why DoxyPEP?**
  - Benefits of DoxyPEP?
  - Harms/adverse effects and unknowns
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# STI Pandemic!

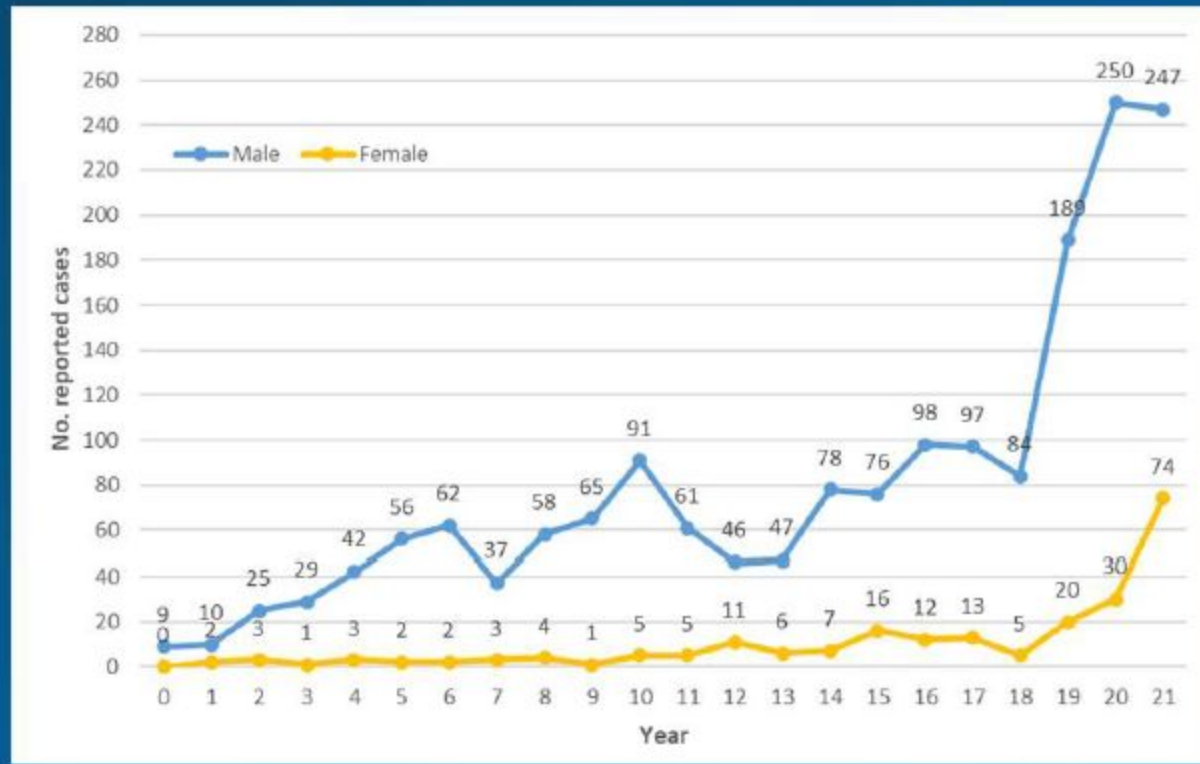
## Primary and Secondary Syphilis — Reported Cases by Sex and Sex of Sex Partners, United States, 2017–2021





# Syphilis in CT

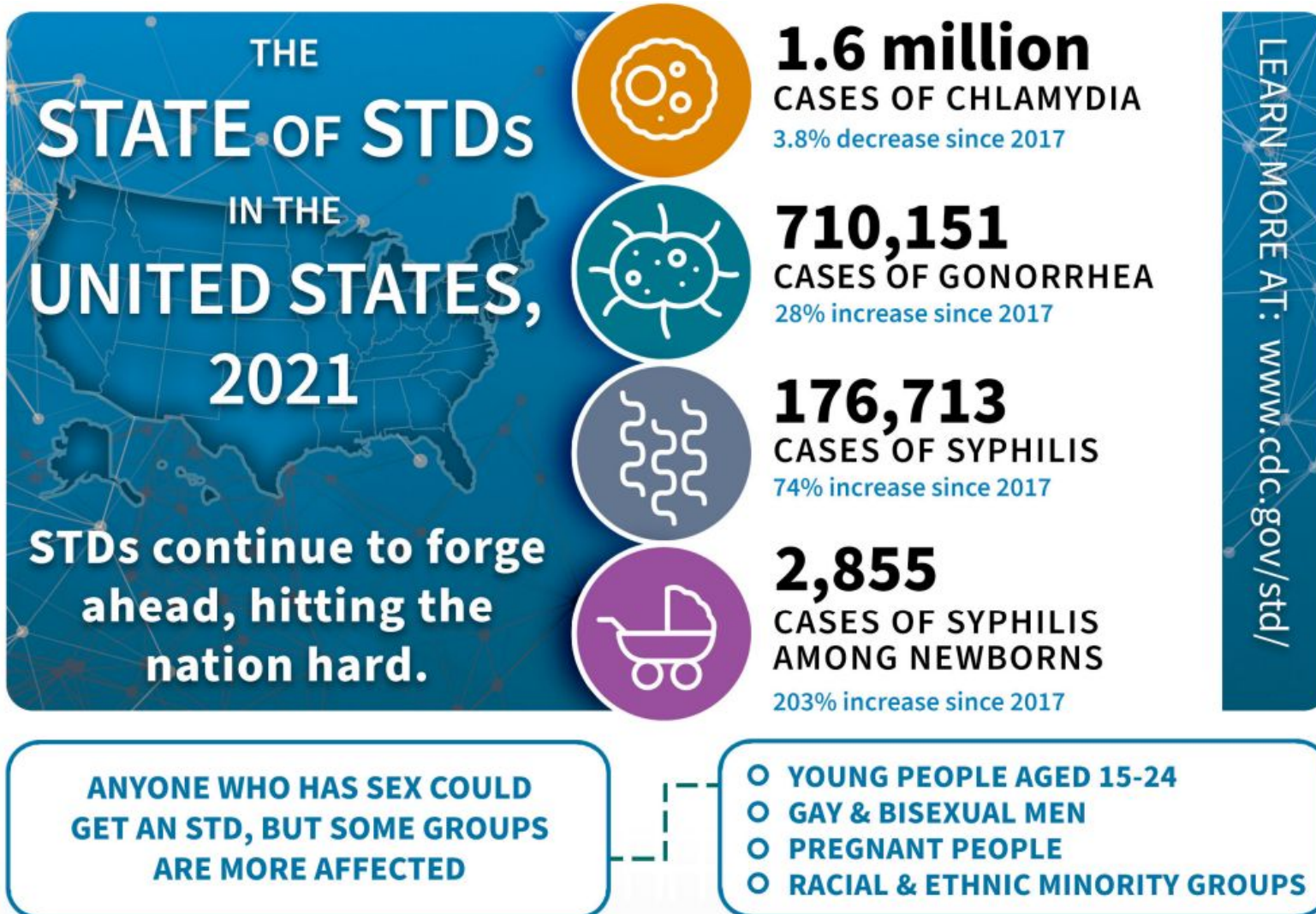
## Primary & Secondary Syphilis Cases by Gender, Connecticut, 2000 - 2021



May 17, 2023



# STIs rising nationally and globally







## Limited STI biomedical prevention options

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- A 24-year-old MSM on HIV PrEP is diagnosed and treated for Syphilis. He asks what can he do to prevent his future risk of Syphilis and other STIs??
- My response should be..
  - *Another reminder about condom use?*
  - *Moral lecture on sexual abstinence or monogamous relationship?*
  - *Something else?*





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**Intervention:** Open label doxycycline 200mg taken as PEP within 72 hours after condomless sexual contact  
*Maximum of 200 mg every 24 hours*

**Inclusion criteria:**

- Male sex at birth
- Living with HIV or on PrEP
- $\geq 1$  STI in past 12 months
- Condomless sex with  $\geq 1$  male partner in past 12 months

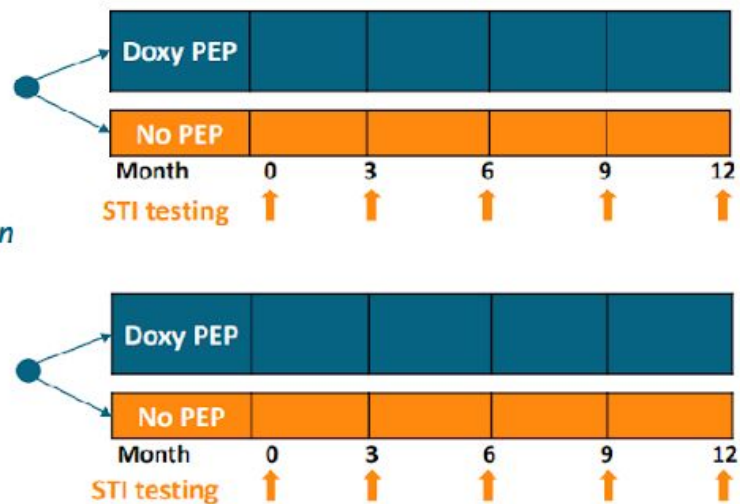
**STI Testing:** Quarterly 3 site GC/CT testing + RPR, GC culture before treatment

**Sites:** San Francisco & Seattle HIV & STI clinics

**MSM & TGW  
living with HIV**  
(planned n = 390)

*2:1 randomization*

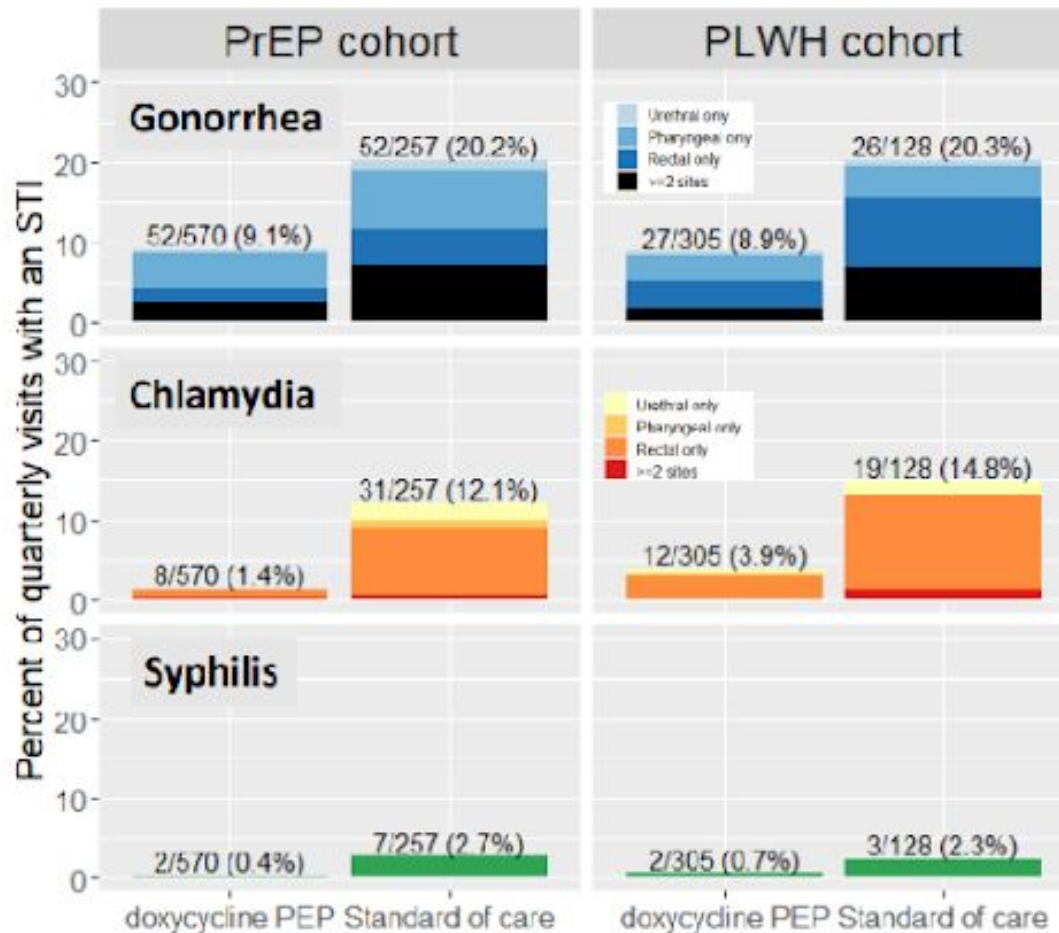
**MSM & TGW  
on HIV PrEP**  
(planned n = 390)



**DOXYPEP**



# DOXYPEP trial



**Individual quarterly STI incidence by study arm & cohort**

**Risk reduction in each STI per quarter (95% CI)**

	PrEP	PLWH
<b>GC</b>	55% (35%-68%) $p < 0.0001$	57% (29%-74%) $p = 0.001$
<b>CT</b>	88% (75%-95%) $p < 0.0001$	74% (43%-88%) $p = 0.0007$
<b>Syphilis</b>	87% (41%-97%) $p = 0.0084$	77% (-71%, 96%) $p = 0.095$



# Doxycycline PEP for STIs: where do we stand?

## Relative risk reduction by Doxy PEP vs no PEP in MSM/TGW

RCT	Setting	Any STIs	Syphilis	Chlamydia	GC
IPEGAY, 2018	France	47%	73%	70%	17%
DoxyPEP, IAS 22	WA/CA	65%	87%	88%	55%
DOXYVAC, CROI 23	France	84%*	79%	89%	51%

Red:  $P < 0.05$ . \*DOXYVAC: Any STI was comp of Syphilis or Chlamydia

Possible other benefits:

Less long-term medical complications?

Less stigma? More disclosure? More dignity?



## DoxyPEP for cis-women?

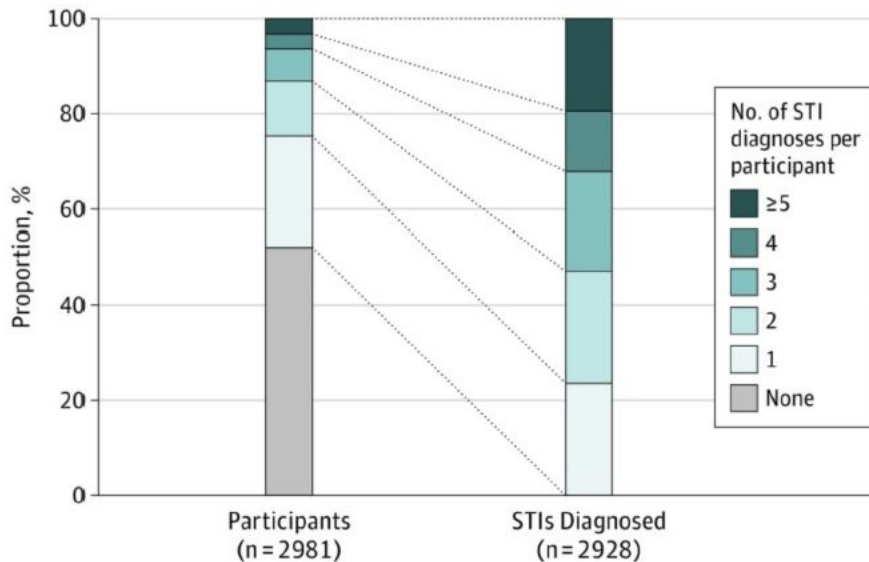
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- Trial done in Kenya showed no efficacy
- But poor adherence to Doxy PEP in study participants
- Studies needed here in US.
- Stay tuned..



# Who might benefit the most from DoxyPEP?

Among a cohort of 2,981 MSM taking PrEP in Australia, 25% of participants accounted for 76% of all STIs.



“Frequent flyers”

- *“Prescribing doxyPEP to individuals with STIs, particularly concurrent or repeated STIs, could avert a substantial proportion of all STI diagnoses.”*
- *The most efficient prescribing strategies are based on STI history rather than HIV status or PrEP use.”*



# Who might benefit the most from DoxyPEP?

## Some useful stats for policy makers

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*About **3% of US Counties** account for **HALF** of all reported STIs!*

**50% of all STIs in 2022 were in young people 15-24 years**

**31% of reported bacterial STIs in 2022 were in non-Hispanic Black people**





# Where does CDC stand?

## Draft guidelines for doxycycline PEP

### Box. Population recommended for consideration for use of doxycycline as PEP for bacterial STI prevention

Recommendation	Strength of recommendation and quality of evidence
<ul style="list-style-type: none"><li>• Doxycycline 200mg taken once orally within 72 hours of oral, vaginal or anal sex should be considered for gay, bisexual, and other men who have sex with men, and for transgender women, with a history of at least one bacterial STI (i.e. gonorrhea, chlamydia or syphilis) in the last 12 months.</li></ul>	<b>AI</b>
<ul style="list-style-type: none"><li>• No recommendation can be given at this time on the use of doxycycline PEP for cisgender women, cisgender heterosexual men, transgender men, other queer and nonbinary individuals. If this intervention is offered, it should be implemented with considerations for ancillary services detailed below.</li></ul>	<b>There is insufficient evidence to assess the balance of benefits and harms of the use of doxycycline PEP</b>



# Outline

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# Harms/adverse effects of DoxyPEP?

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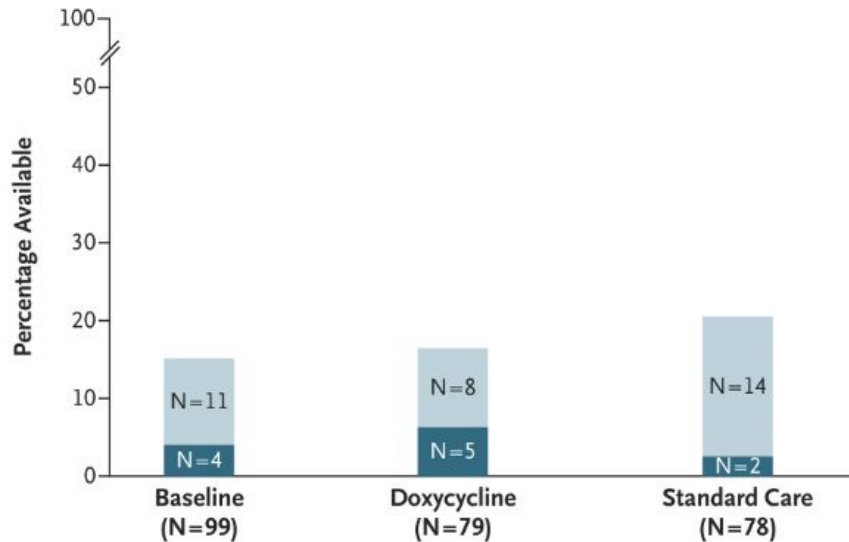
- **Known Doxycycline concerns**
    - Gastrointestinal upset
    - Esophagitis
    - Sunburn
    - **These were rare in Doxy PEP trials** (due to intermittent use?)
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# Harms/adverse effects of DoxyPEP?

- Antibiotic resistance concerns?

A *N. gonorrhoeae* Culture



- ?more doxy-resistance in Gonorrhoea?
- ?Effect on staph aureus?
- Need more data



# Harms/adverse effects of DoxyPEP?

- Antibiotic resistance concerns- balancing act?

Intermittent  
Doxy use for  
PEP

- ↑ Doxy-R  
Gonorrhea  
- other?  
resistance?

- ↓ Penicillin use for  
Syphilis

- ↓ Ceftriaxone use  
for Gonorrhea

- ↓ 7-day doxy use  
for Chlamydia

Net effect will probably be determined by how careful we are  
in implementing Doxy PEP



## Doxy PEP Unknowns

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- Effect on gut microbiome?
  - Doxy less likely to cause Cdiff
- How long will the benefit of DoxyPEP last?
  - Net public health benefit?
- Benefit for other populations: heterosexual men and cis-women, transgender men, others?
- How to ensure equitable access?



# HIV and STI Prevention 2023

## DoxyPEP is just one piece of the puzzle

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- HIV PrEP
- STI testing and treatment
- Partner testing and Expedited Partner Therapy for GC/CT
- Doxy PEP for MSM/TGW
- Mpox Vaccine
- Substance use services
- Hepatitis testing and treatment





# HIV and STI Prevention -what to lookout for in near future

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- HIV PrEP Q6-monthly shots
  - Gonorrhea and HSV vaccines in development
  - More data on DoxyPEP and may be DoxyPrEP ([godisco.ca](http://godisco.ca))
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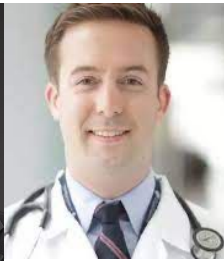


## STD Clinical Consultation Network (STDCCN)

- Provides STI/STD clinical consultation services within 1-5 business days, depending on urgency, to clinicians nationally
- Consultation request is linked to your regional PTC's STI/STD expert faculty
- Just a click away: [www.STDCCN.org](http://www.STDCCN.org)
- Also embedded in Treatment Guidelines App!



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