

## Sexually Transmitted Infections: Prevention and Treatment

Meredith Clement, MD  
Assistant Professor of Medicine  
Louisiana State University  
New Orleans, Louisiana

---

---

---

---

---

---

---

---

## Financial Relationships With Commercial Entities

Dr Clement reports research grants paid to her institution from Gilead Sciences, Inc., ViiV Healthcare, and Janssen. She receives royalties from UpToDate, Inc. (Updated 04/20/21)

Slide 2 of 35

---

---

---

---

---

---

---

---

## Outline

- Epi Overview: STIs in 2019 (and 2020)
- The COVID-19 Pandemic and its Impact
- STI Prevention: Current and (potential) future methods
- STI Treatment: CDC's treatment guideline update

Slide 3 of 35

---

---

---

---

---

---

---

---

## Learning Objectives

After attending this presentation, learners will be able to:

- Manage and treat STIs in the pandemic era
- Weigh risks and benefits of antibiotic prophylaxis for STIs
- Describe new updates to CDC guided treatment for Gonorrhea

Slide 4 of 35

---

---

---

---

---

---

---

---

## Outline

- **Epi Overview: STIs in 2019 (and 2020)**
- The COVID-19 Pandemic and its Impact
- STI Prevention: Current and (potential) future methods
- STI Treatment: CDC's treatment guideline update

Slide 5 of 35

---

---

---

---

---

---

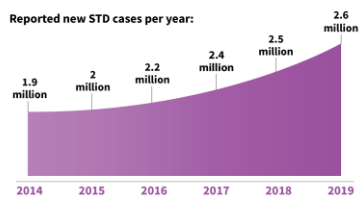
---

---

## STI Epidemiology

**6th consecutive year  
of RECORD-BREAKING STD cases**

Reported new STD cases per year:



Slide 6 of 35

<https://www.cdc.gov/nchhstp/newsroom/>

---

---

---

---

---

---

---

---

## STI Epidemiology

**2,554,908**  
COMBINED CASES  
REPORTED IN 2019

- **Chlamydia**  
1,808,703 cases  
83 per 100,000 people
- **Gonorrhea**  
616,392 cases  
112 per 100,000 people
- **Syphilis (all stages)**  
129,813 cases  
43 per 100,000 people

Notifiable disease and/or reportable  
25,492 cases      1,670 cases  
12 per 100,000 people      47 per 100,000 live births

**SYPHILIS IN NEWBORNS IS ON THE RISE IN U.S.**

Congenital syphilis is a disease that can cause miscarriage, premature births, stillbirths, or even death in newborn babies.

From 2011-2019, rates of congenital syphilis have nearly **QUADRUPLED**

A mother is likely to pass syphilis on to her baby if she is not treated.

https://www.cdc.gov/hct/hsp/newsroom/

Slide 7 of 35

---

---

---

---

---

---

---

---

---

---

---

---

## STI Epidemiology

**Reporting Overview: 2020 cases as percent of 2019 cases**

Reported Cases in 2020 as a Percentage of Cases Reported During the Equivalent Period of 2019, by Week and STD

Slide 8 of 35      Impact of COVID-19 on STD Surveillance. National STD Prevention Conference. Sept 2020.

---

---

---

---

---

---

---

---

---

---

---

---

## Outline

- Epi Overview: STIs in 2019 (and 2020)
- **The COVID-19 Pandemic and its Impact**
- STI Prevention: Current and (potential) future methods
- STI Treatment: CDC's treatment guideline update

Slide 9 of 35

---

---

---

---

---

---

---

---

---

---

---

---

## STI Control in Pandemic Times

The COVID-19 pandemic has been detrimental to efforts to fight STIs:

- Clinic closures, PPE shortages, modified hours/workflow
- 87% of STD programs involved in their city or state's COVID-19 contact tracing
- STD programs: currently reporting 37% of staff redeployed to COVID-19 response
- Interference with STD control: reduced Disease Intervention Services (DIS)

Slide 10 of 35

COVID-19 & The State of the STD Field: Phase III. [ncatdc.org](http://ncatdc.org)

---

---

---

---

---

---

---

---

---

---

## STI Control in Pandemic Times

Shortages: staffing, supplies, solutions

- Staffing involved in Vaccine Administration: 29% of jurisdictions utilizing DIS, ~8% more will be soon
- Supplies/test kits:
  - 35% of CLIA-certified labs reported supply shortages
  - Molecular testing machines diverted to COVID testing
- Solutions/treatments: Azithromycin shortages during the beginning of the pandemic, reports of cefixime, gent also

Slide 11 of 35

<https://asm.org/Articles/2020/September/Clinical-Microbiology-Supply-Shortage-Collect-1>

---

---

---

---

---

---

---

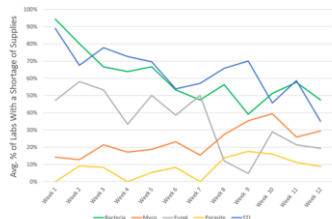
---

---

---

## STI Control in Pandemic Times

Non-COVID-19 Laboratory Testing Supplies Shortages



Slide 12 of 35

<https://asm.org/Articles/2020/September/Clinical-Microbiology-Supply-Shortage-Collect-1>

---

---

---

---

---

---

---

---

---

---

## STI Control in Pandemic Times - Solutions

### Overcoming COVID Challenges

- Efforts to remain open - Symptom screening, limiting hours, eliminating walk-ins
- Defer routine screening visits
- Prioritize those reporting symptoms or STI contacts and individuals at high risk of infection
- Express visits – test/treat without an exam

Slide 13 of 35

[https://www.cdc.gov/hct/hst/dear\\_colleague/2020/dcl-040620-sti-treatment-options.html](https://www.cdc.gov/hct/hst/dear_colleague/2020/dcl-040620-sti-treatment-options.html)

---

---

---

---

---

---

---

---

## STI Control in Pandemic Times - Solutions

### Overcoming COVID Challenges, cont.

- Syndromic management when needed
- Partner with other local clinics/pharmacies for injection administration
- Provide oral medications when injections not feasible

Question	Recommended Practices to Consider in Response to the COVID-19 Pandemic	Alternative Practices Being Implemented	Notes
How should we manage patients with symptoms of STI?	Continue to follow CDC guidance on screening and treatment. Consider deferring routine screening and treatment for patients who are asymptomatic and at low risk of infection. For patients with symptoms, prioritize those with high risk of infection and those who are unable to be reached by other means. Consider offering telemedicine for patients with symptoms who are unable to be reached by other means. Consider offering telemedicine for patients with symptoms who are unable to be reached by other means.	Offering telemedicine for patients with symptoms who are unable to be reached by other means. Offering telemedicine for patients with symptoms who are unable to be reached by other means.	The advantages of telemedicine include increased patient access and convenience, reduced wait times, and the ability to reach patients who are unable to be reached by other means.
How should we manage patients with STI who are unable to be reached by other means?	Consider offering telemedicine for patients with symptoms who are unable to be reached by other means. Consider offering telemedicine for patients with symptoms who are unable to be reached by other means.	Offering telemedicine for patients with symptoms who are unable to be reached by other means. Offering telemedicine for patients with symptoms who are unable to be reached by other means.	Telemedicine can be used to provide advice and support to patients who are unable to be reached by other means.
How should we manage patients with STI who are unable to be reached by other means?	Consider offering telemedicine for patients with symptoms who are unable to be reached by other means. Consider offering telemedicine for patients with symptoms who are unable to be reached by other means.	Offering telemedicine for patients with symptoms who are unable to be reached by other means. Offering telemedicine for patients with symptoms who are unable to be reached by other means.	Telemedicine can be used to provide advice and support to patients who are unable to be reached by other means.
How should we manage patients with STI who are unable to be reached by other means?	Consider offering telemedicine for patients with symptoms who are unable to be reached by other means. Consider offering telemedicine for patients with symptoms who are unable to be reached by other means.	Offering telemedicine for patients with symptoms who are unable to be reached by other means. Offering telemedicine for patients with symptoms who are unable to be reached by other means.	Telemedicine can be used to provide advice and support to patients who are unable to be reached by other means.
How should we manage patients with STI who are unable to be reached by other means?	Consider offering telemedicine for patients with symptoms who are unable to be reached by other means. Consider offering telemedicine for patients with symptoms who are unable to be reached by other means.	Offering telemedicine for patients with symptoms who are unable to be reached by other means. Offering telemedicine for patients with symptoms who are unable to be reached by other means.	Telemedicine can be used to provide advice and support to patients who are unable to be reached by other means.

Slide 14 of 35

[https://www.cdc.gov/hct/hst/dear\\_colleague/2020/dcl-040620-sti-treatment-options.html](https://www.cdc.gov/hct/hst/dear_colleague/2020/dcl-040620-sti-treatment-options.html)

---

---

---

---

---

---

---

---

## Outline

- Epi Overview: STIs in 2019 (and 2020)
- The COVID-19 Pandemic and its Impact
- STI Prevention: Current and (potential) future methods
- STI Treatment: CDC's treatment guideline update

Slide 15 of 35

---

---

---

---

---

---

---

---

## STI Prevention

- Condoms
- Behavioral interventions
- Expedited Partner Therapy, Novel Partner Services
- Test and Treat (Home testing, rapid diagnostics)
- Vaccines and Antibiotic Prophylaxis

Slide 16 of 35

---

---

---

---

---

---

---

---

## STI Prevention

- Condoms
- Behavioral interventions
- Expedited Partner Therapy, Novel Partner Services
- Test and Treat (Home testing, rapid diagnostics)
- Vaccines and Antibiotic Prophylaxis

Slide 17 of 35

---

---

---

---

---

---

---

---

## STI Prevention - EPT

### Expedited Partner Therapy:

- Treating the sex partners of your clients in order to reduce reinfections and subsequent adverse health outcomes.
- Medications/prescriptions are provided to the client to then provide to their partners.
- Important harm reduction strategy, but should be limited to situations in which a partner would not otherwise receive timely treatment.
- Safe and effective for gonorrhea and chlamydia.

Slide 18 of 35

---

---

---

---

---

---

---

---

## STI Prevention - EPT

### Expedited Partner Therapy:

- No data on the use of EPT for sex partners of persons diagnosed with syphilis to prevent adverse health outcomes
- Pre-COVID standard of care: have the contact evaluated, tested and treated in a clinical setting
- Laboratory tests to confirm a syphilis diagnosis and to follow response to therapy are essential
- CDC does not currently recommend the use of EPT for the management of sex partners of individuals diagnosed with syphilis.

Slide 19 of 35

[https://www.cdc.gov/hct/htp/idear\\_collague/2020/idd-061920-clarification.html](https://www.cdc.gov/hct/htp/idear_collague/2020/idd-061920-clarification.html)

---

---

---

---

---

---

---

---

## STI Prevention – Home Testing

### Home Testing:

- Mail-in Testing Kits – available and generally reliable
- 2015 Cochrane Review: Clients participating in home-based testing prefer the simplicity, security, and privacy of self-collected specimens
- CDC: Molecular Testing Labs - CLIA licensed, ordered by physicians, covered by most insurance



Slide 20 of 35

Fajardo-Bernal et al. Cochrane Database Syst Rev. 2015 Sep 29;(9):CD011317.

---

---

---

---

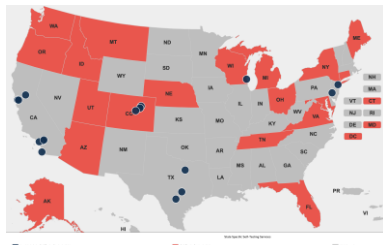
---

---

---

---

## STI Prevention – Home Testing



Slide 21 of 35

<https://www.nastad.org/maps/state-specific-self-testing-services>

---

---

---

---

---

---

---

---

## STI Prevention - Condoms

### Condoms:

*“It is difficult, if not impossible, to determine the magnitude of benefit of condom use on preventing the spread of STIs; it is clear, however, that condom promotion alone has not been sufficient.”*



Slide 22 of 35

National Academies of Sciences, Engineering, and Medicine. 2021. Sexually Transmitted Infections: Adopting a Sexual Health Paradigm.

---

---

---

---

---

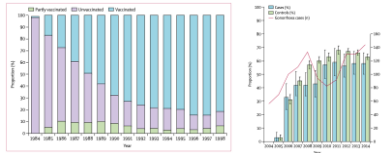
---

---

---

## STI Prevention - Vaccines

Effectiveness of a group B outer membrane vesicle meningococcal vaccine against gonorrhoea in New Zealand: a retrospective case-control study



	Crude OR (95% CI)	p-value	Adjusted OR* (95% CI)	p-value
Vaccination status†				
Vaccinated vs unvaccinated	0.67 (0.59-0.76)	<0.0001	0.49 (0.43-0.57)	<0.0001
Partially vs unvaccinated	1.09 (0.87-1.37)	0.44	1.09 (0.86-1.37)	0.49

Slide 23 of 35

Petousis-Harris et al. Lancet. 2017.

---

---

---

---

---

---

---

---

## STI Prevention – Antibiotic Prophylaxis

### iPERGAY OLE: Doxycycline Post-Exposure Prophylaxis Study

Randomized Open-Label Trial (July 2015- July 2016)



- 232 Participants
- Follow-up: median of 8.7 months

Slide 24 of 35

Molina JM et al. Lancet ID 2018

---

---

---

---

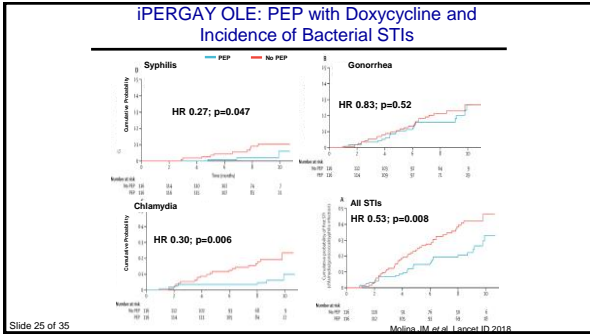
---

---

---

---






---

---

---

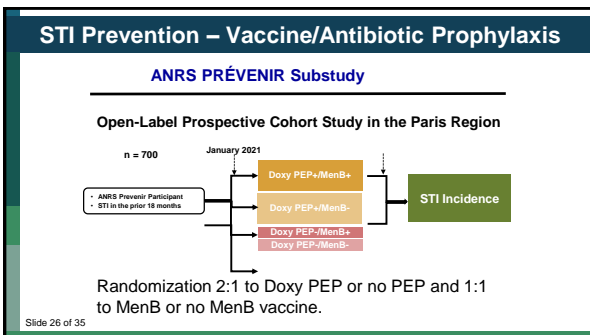
---

---

---

---

---




---

---

---

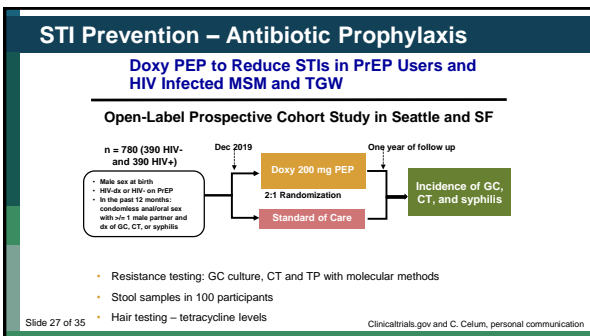
---

---

---

---

---




---

---

---

---

---

---

---

---

## Antibiotic Prophylaxis for STI Prevention

- Considering Risks/Benefits
- Resistance implications
- Changes in microbiome
- Side effects
- Cost?
- Risk Compensation

Figure: Recommendations for research activities

- **Clinical efficacy:** Quantifying clinical efficacy in a variety of populations is needed.
- **Dosing strategies:** Daily and post-exposure/event-driven dosing is being studied. Other options, such as weekly dosing, should be investigated.
- **Core group focused intervention:** Modeling and analyses of pooled study data are needed to identify the populations most suitable for maximizing the impact of doxycycline prophylaxis.
- **Formulation:** Clear information on the frequency of side effects for different doxycycline formulations is needed. Direct comparisons using randomized clinical trials may be appropriate. Further long-term studies on side effects are also needed.
- **Educational efforts:** Prior to broad implementation, effective educational campaigns are needed to ensure that high-risk populations clearly understand the difference between HIV PEP and Doxy PEP/PEP.
- **Risk compensation:** Ongoing monitoring for risk compensation in all trials is critical.
- **Resistance monitoring:** All studies should robustly investigate development of resistance in bacterial STIs as well as commensal organisms. Standardized laboratory methods for defining and monitoring doxycycline resistance in STIs are needed.
- **Cost-effectiveness:** Cost-effectiveness analyses are needed to better understand the utility of Doxy PEP/PEP.

Slide 28 of 35
Grant et al. Clin Infect Dis. 2019

---

---

---

---

---

---

---

---

---

---

---

---

## Outline

- Epi Overview: STIs in 2019 (and 2020)
- The COVID-19 Pandemic and its Impact
- STI Prevention: Current and (potential) future methods
- **STI Treatment: CDC's treatment guideline update**

Slide 29 of 35

---

---

---

---

---

---

---

---

---

---

---

---

## STI Treatment- New Recommendations

Update to CDC's Treatment Guidelines for Gonococcal Infection, 2020

Weekly / December 18, 2020 / 69(50):1911-1916

1. Increase in ceftriaxone dosing
2. Azithromycin to Doxycycline switch for Chlamydia coinfection

Slide 30 of 35
St. Cyr S et al. MMWR Morb Mortal Wkly Rep 2020;69:1911-1916

---

---

---

---

---

---

---

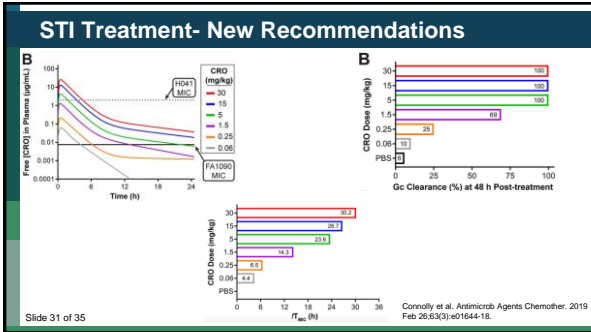
---

---

---

---

---




---

---

---

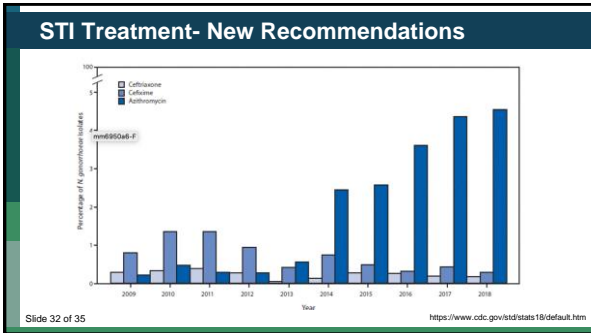
---

---

---

---

---




---

---

---

---

---

---

---

---

### STI Treatment – New Recommendations

**Regimen for Uncomplicated Gonococcal Infections of the Cervix, Urethra, or Rectum**

- Ceftriaxone 500mg IM as a single dose for those weighing <150 kg (or 300 lb)
- If weight ≥/ 150 kg (300 lb) → Ceftriaxone 1000mg IM
- If chlamydia infection has not been excluded, treat with doxy 100 mg BID for 7 days
- During pregnancy, still use azithromycin 1 g to treat chlamydia

Slide 33 of 35

---

---

---

---

---

---

---

---

## STI Treatment – New Recommendations

### Alternative Regimens for Uncomplicated Gonococcal Infections of the Cervix, Urethra, or Rectum if Ceftriaxone is Not Available:

- Gentamicin 240 mg IM as a single dose plus azithromycin 2 g orally as a single dose
- Cefixime 800 mg orally as a single dose.
- If treating with cefixime, still use doxy 100 mg BID x 7 days in cases where chlamydia has not been excluded
- Unless client is pregnant, still use azithromycin 1 g to treat chlamydia

Slide 34 of 35

---

---

---

---

---

---

---

---

## STI Treatment – New Recommendations

### Regimen for Uncomplicated Gonococcal Infections of the Pharynx:

- Ceftriaxone 500mg IM for those weighing <150 kg (or 300 lb)
- If weight  $\geq$  150 kg (300 lb)  $\rightarrow$  Ceftriaxone 1000mg IM
- If chlamydia not excluded, use doxy (azithromycin if pregnant)
- No reliable alternative treatments are available
- If reported beta-lactam allergy  $\rightarrow$  conduct a thorough assessment
- If anaphylaxis or severe reaction  $\rightarrow$  consult ID
- Test of cure recommended at 7-14 days

Slide 35 of 35

---

---

---

---

---

---

---

---

## Question-and-Answer Session



---

---

---

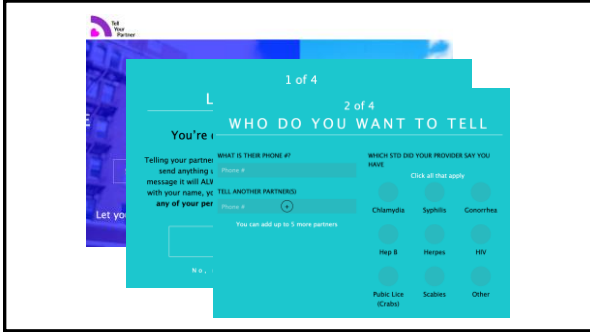
---

---

---

---

---




---

---

---

---

---

---

---

---




---

---

---

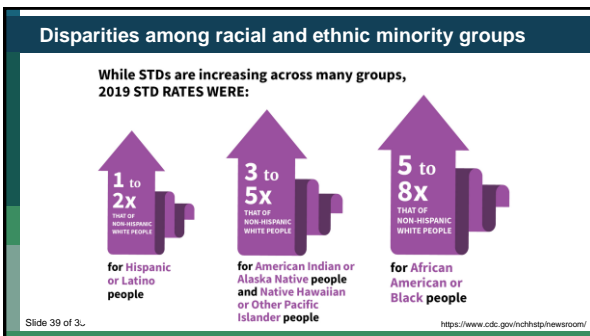
---

---

---

---

---




---

---

---

---

---

---

---

---