

2024: Advancing Urgent Care Point-of-Care Diagnostics to Combat the Ongoing STI Epidemic

Glenn Harnett MD, FCUCM



Glenn Harnett MD, FCUCM

- JUCM Editorial Board Member
- Author: Harnett G. “The rising importance of urgent care in the fight against the STI epidemic”. J Urgent Care Med. 2022;16(3):15-20
- BA Psychology: University of New Hampshire
- MD: Medical College of Georgia
- Residency: Emory Emergency Medicine, Chief Resident
- 5 years Chief Medical Officer, American Family Care
- Fellow College of Urgent Care Medicine
- Chief Executive Officer: No Resistance Clinical Trial Site Management

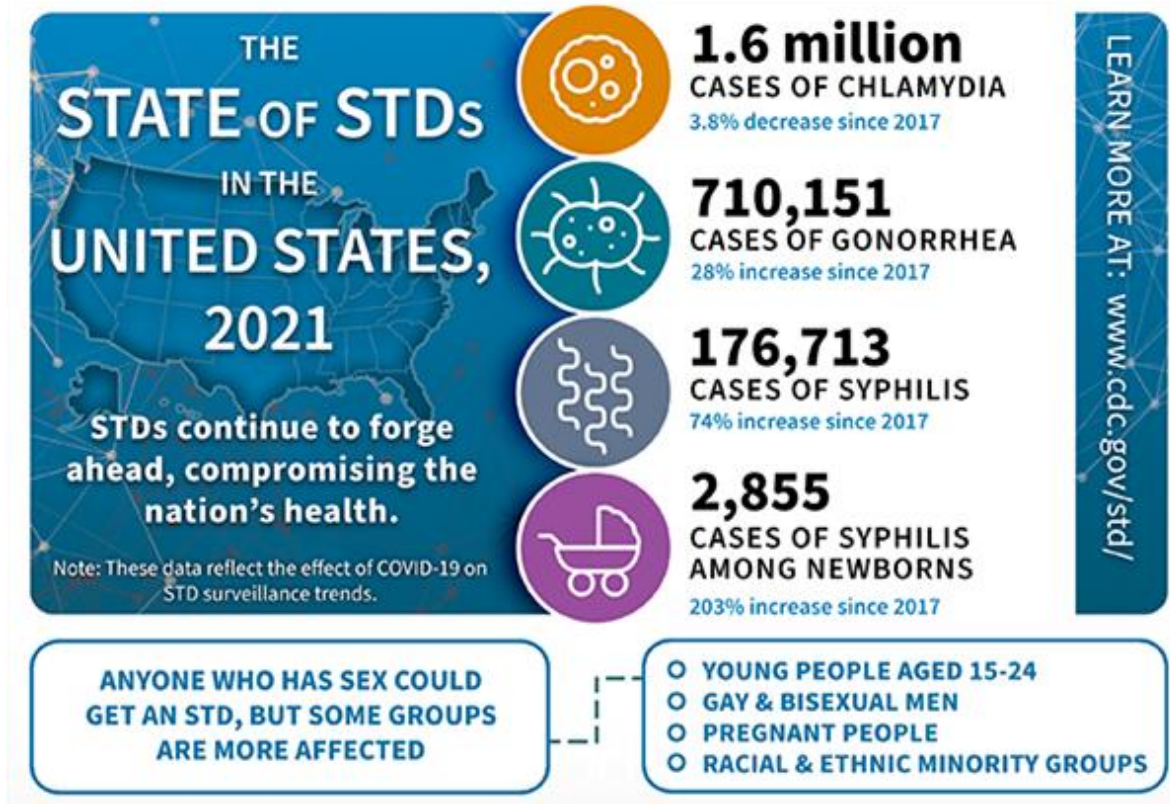
Disclosures

- Dr Harnett is a principal investigator in ongoing or recently completed POCT clinical trials sponsored by lab device manufacturers including Roche, Abbott, Becton Dickinson, and Visby
- Dr Harnett has received marketing consulting fees from Visby Medical, Binx, Aptitude Medical, Abbott, Becton Dickinson, and BioMérieux in the previous 24 months

Learning Objectives

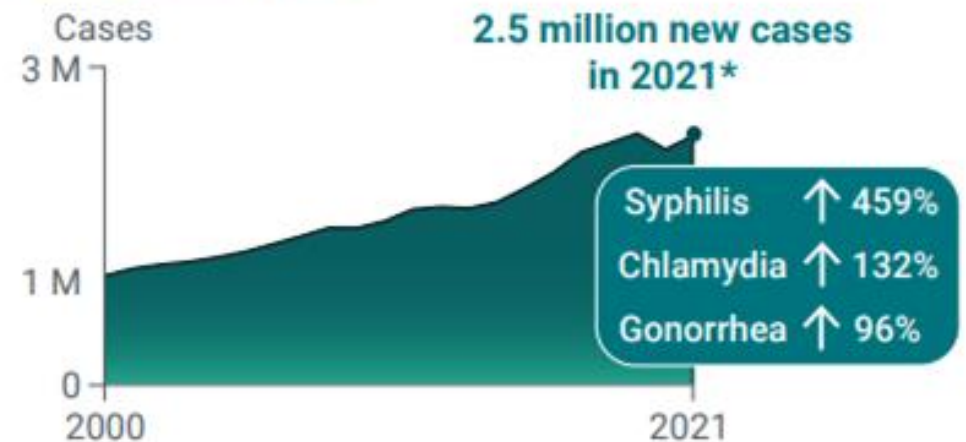
- Examine key challenges with STI testing today in Urgent care including patients lost to follow-up, implications of overtreatment/undertreatment of STI
- Review applicable CDC STI Treatment & Screening Guidelines
- Discuss sexual health education strategies for STIs in young people
- Examine the importance of timely STI diagnosis and appropriate treatment
- Discuss definitive/directed antibiotic therapy vs empiric/presumptive treatment
- Evaluate the implications of today's STI testing to Antibiotic Stewardship

STIs at all time high



STI Overview

Chlamydia, gonorrhea, and syphilis cases have been increasing for years.



Nomenclature for discussion

Chlamydia trachomatis: CT

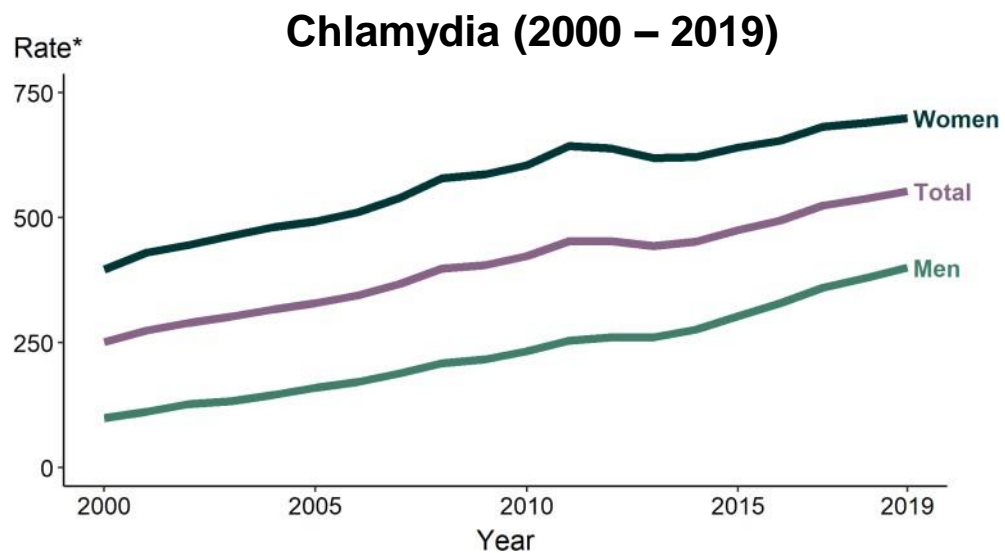
Neisseria gonorrhoea: NG



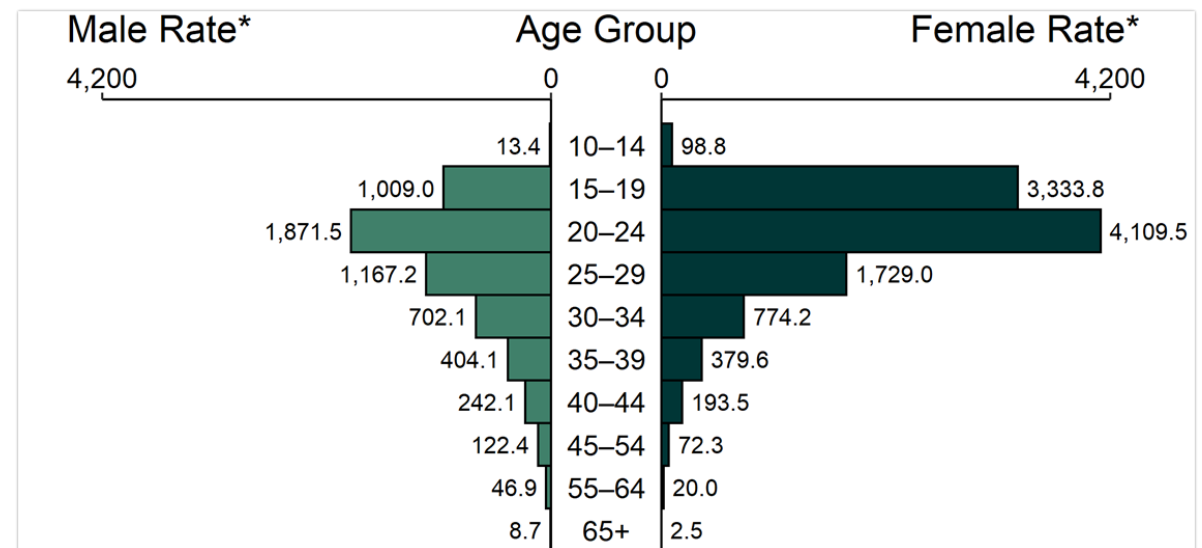
Together = CTNG

Chlamydia: 1,808,703 Reported Cases in 2019

- 10% increase among females aged 15–24 years since 2015¹
- Rates among children less than age 14 may be underestimated due to lower rates of testing
- Up to 80% of women are asymptomatic²



Chlamydia – Rates of reported cases by sex [2000-2019]



1. <https://www.cdc.gov/std/statistics/2019/overview.htm>

2. In: Markos AR, ed. Sexually transmitted diseases. Nova Science Publishers, Inc.; 2009:37-43.]

Complications of CTNG Infections

- Pelvic inflammatory disease
- Ectopic pregnancy
- Infertility
- Chronic pelvic pain
- Increased risk for HIV transmission and acquisition

Because so many infections are initially asymptomatic, some women don't exhibit recognizable symptoms until complications (eg, PID) have occurred

A New Role for Urgent Care

- In the 1980s and 1990s, most STI care was provided in dedicated STI clinics. Funding cuts have led to a decrease in these clinics, with almost 80% of STI cases now diagnosed in non-STI clinics
- Nearly half of Millennials and Gen Z (aged 10-41) do not have a PCP
- STD care in Urgent Care, at a minimum, should encompass the following:
 - Sexual history
 - Risk assessment
 - Screening
 - Treatment services

Take-Home Message

*80% of STI cases are now
diagnosed in non-STI
clinics*

CDC Treatment Guidelines: Chlamydia

Chlamydial Infections

| Risk Category | Recommended Regimen | Alternatives |
|------------------------|---|---|
| Adults and adolescents | doxycycline 100 mg orally 2x/day for 7 days | azithromycin 1 gm orally in a single dose OR levofloxacin 500 mg orally 1x/day for 7 days |
| Pregnancy | azithromycin 1 gm orally in a single dose | amoxicillin 500 mg orally 3x/day for 7 days |

CT Important Change

- *Azithromycin removed as first-line therapy*

Presumptive treatment for CTNG should be provided for men and women at increased risk, in areas with a high prevalence of CTNG, if follow-up cannot be ensured, or if testing with NAAT is not possible.

CDC Treatment Guidelines: Gonorrhea

Gonococcal Infections

| Risk Category | Recommended Regimen | Alternatives |
|--|--|--|
| Uncomplicated infections of the cervix, urethra, and rectum: adults and adolescents <150 kg ⁶ | ceftriaxone 500 mg IM in a single dose ¹⁷ | If cephalosporin allergy: gentamicin 240 mg IM in a single dose PLUS azithromycin 2 gm orally in a single dose If ceftriaxone administration is not available or not feasible: cefixime 800 mg orally in a single dose ¹⁷ |
| Uncomplicated infections of the pharynx: adults and adolescents <150 kg ⁶ | ceftriaxone 500 mg IM in a single dose ¹⁷ | |
| Pregnancy | ceftriaxone 500 mg IM in a single dose ¹⁷ | |

NG Important Changes

- Higher-dose ceftriaxone recommended
- Azithromycin no longer recommended as dual therapy

For persons weighing ≥ 150 kg, 1 gm of ceftriaxone should be administered.

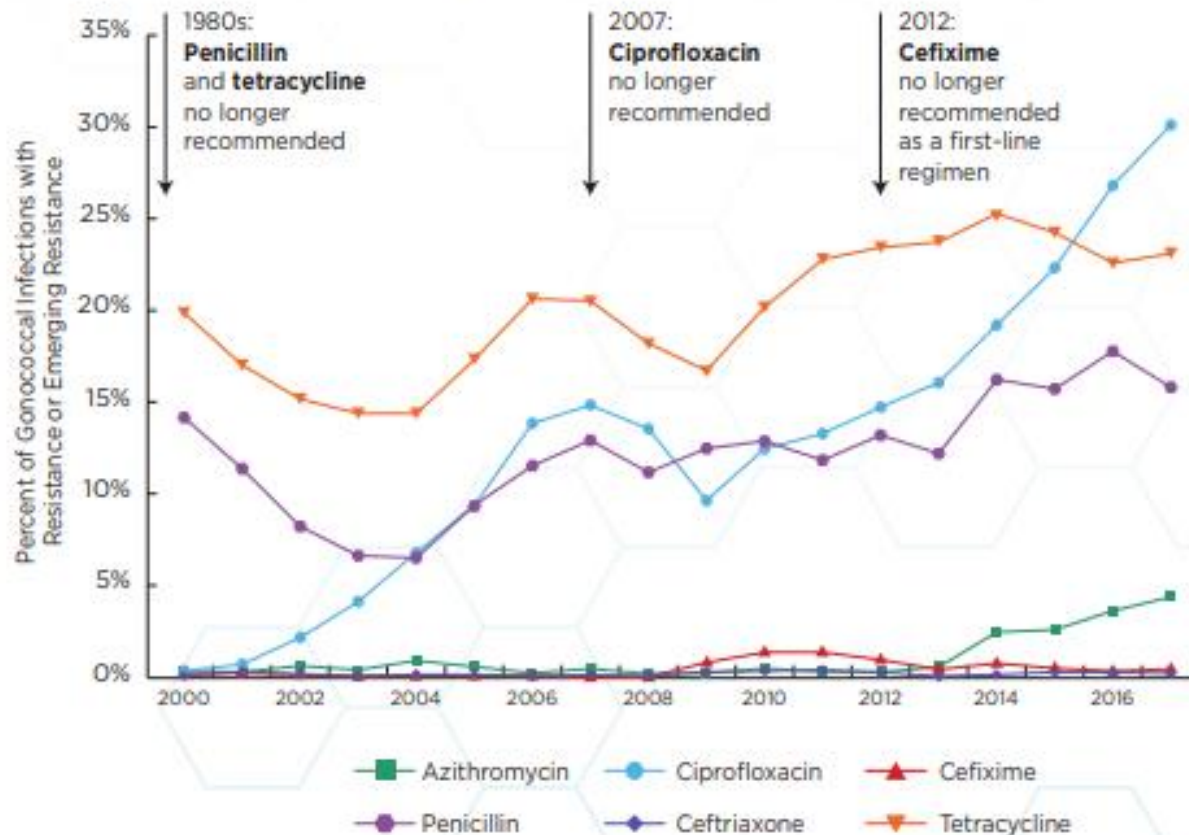
DRUG-RESISTANT *NEISSERIA GONORRHOEAE*

THREAT LEVEL **URGENT**



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Gonorrhea rapidly develops resistance to antibiotics—ceftriaxone is the last recommended treatment.



Stewardship Tip!

The advent of new and more rapid point-of-care CT and NG testing will make it easier to exclude co-infection with both pathogens.

Stick to monotherapy if either CT or NG has been excluded by testing.

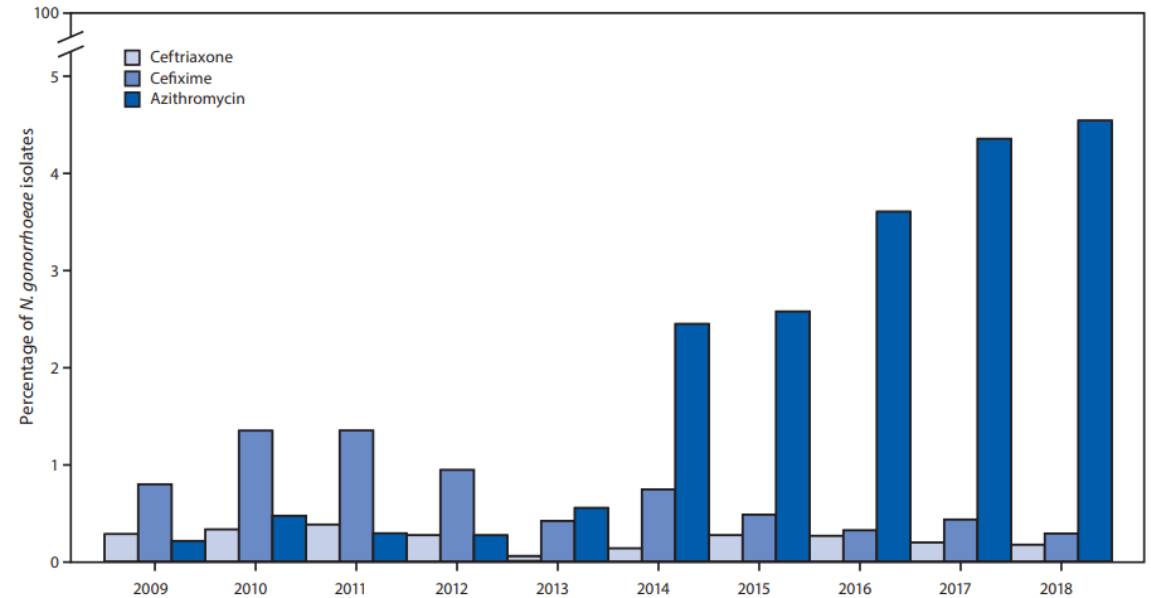
Azithromycin Resistance Rising!

Reasoning Behind 2021 Guideline Changes

- Increased incidence of azithromycin resistance to *N. gonorrhoeae*
- *N. gonorrhoeae*'s ability to acquire antimicrobial resistance influences treatment recommendations
- Pharmacokinetic and pharmacodynamic modeling has also affected the understanding of optimal antimicrobial dosing for *N. gonorrhoeae* treatment (250 mg ceftriaxone has insufficient MIC to adequately treat)
- Increasing concern for antimicrobial stewardship and the potential impact of dual therapy on the microbiome and concurrent pathogens

Morbidity and Mortality Weekly Report

FIGURE. Percentage of *Neisseria gonorrhoeae* isolates with elevated minimum inhibitory concentrations (MICs)* to ceftriaxone, cefixime, and azithromycin — Gonococcal Isolate Surveillance Project, United States, 2009–2018



Follow-Up Considerations

- **Non-gonococcal/chlamydia urethritis:** If CTNG testing is negative, consideration should be given to other causes of urethritis including:
 - Mycoplasma genitalium (15-20% of cases)
 - Trichomonas vaginalis
 - HSV
 - EBV
 - Adenovirus
- **Other Tests:** All persons who receive a diagnosis of gonorrhea should be tested for other STIs, including chlamydia, syphilis, and HIV
- **Retest in 3 months:** Due to high rates of reinfection (regardless of whether their sex partners were treated), both men and women should be instructed to return in 3 months after treatment for repeat testing—even if asymptomatic
- **Partner testing:** All sex partners during the previous 60 days should be referred for evaluation, testing, and presumptive treatment
- **Avoiding reinfection:** To minimize disease transmission, persons treated for gonorrhea should be instructed to abstain from sexual activity for 7 days after treatment and until all sex partners are treated (7 days after receiving treatment and resolution of symptoms, if present)

Expedited Partner Therapy

What is EPT?

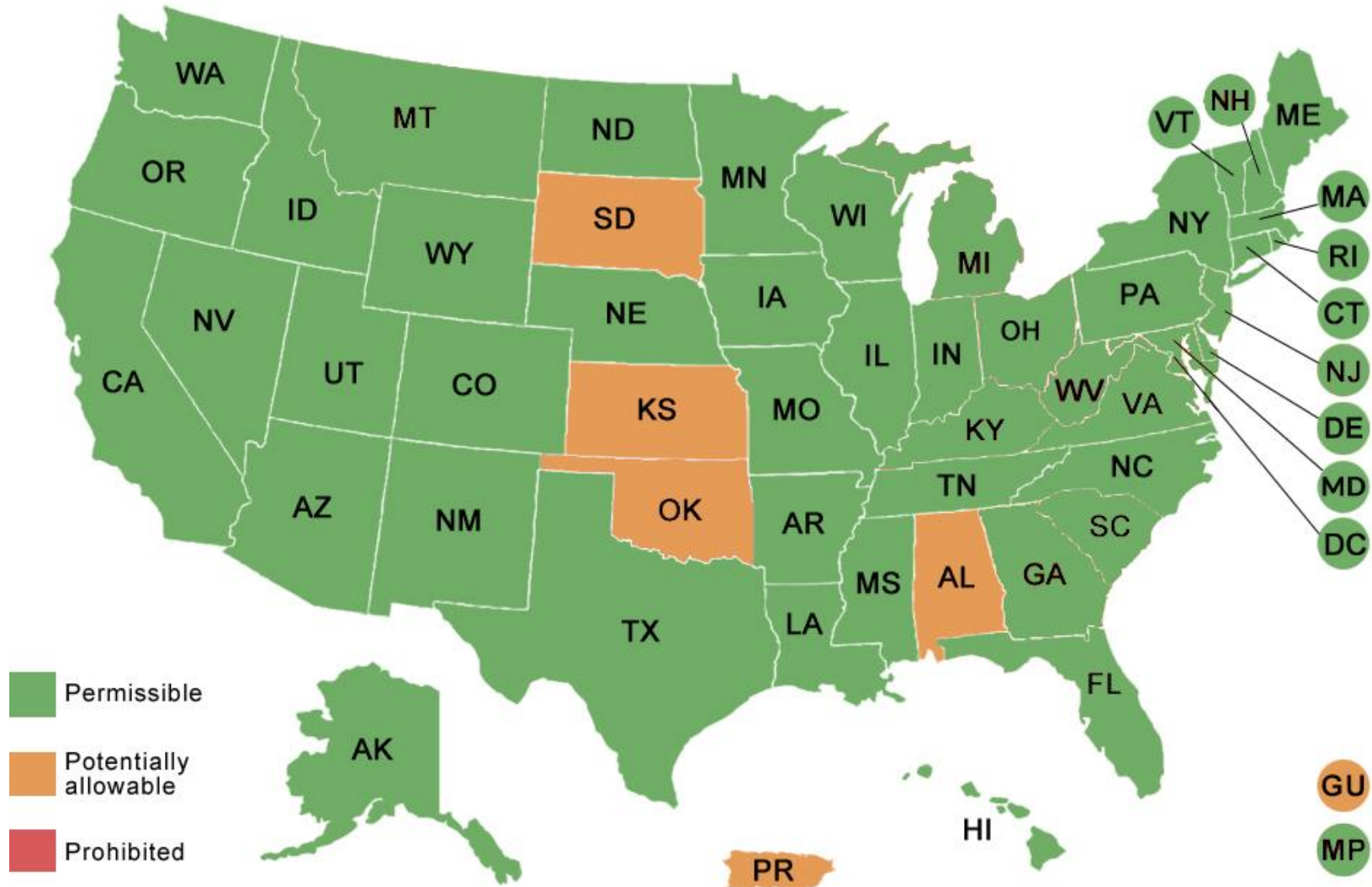
- Expedited Partner Therapy (EPT) is the clinical practice of treating the sex partners of patients diagnosed with chlamydia or gonorrhea by providing prescriptions or medications to the patient to take to his/her partner **without** the health care provider first examining the partner
- Treatment of the patients' sex partners to prevent reinfection and curtail further transmission
- EPT can be delivered to the partner by the patient, or a pharmacy as permitted by state law¹

Treatment:

- Treating sexual partner with **cefixime 800 mg orally as a single dose** is recommended, provided that concurrent chlamydial infection has been excluded.
- If a chlamydia test result has not been documented, the partner may be treated with a single dose of oral cefixime 800 mg plus oral **doxycycline 100 mg 2 times/day for 7 days**
- If adherence with multiday dosing is a considerable concern, **azithromycin 1 g orally as a single dose** can be considered - but has lower treatment efficacy among persons with rectal chlamydia

1. <https://www.cdc.gov/std/ept/legal/default.htm>

Legal Status of Expedited Partner Therapy (EPT)



Urine vs SCVS vs Provider-Collected Endocervical or Urethral Swab for CTNG Testing

- SCVS vs Endocervical (CT and NG in women)
 - Sensitivity: 92%–98%
 - Specificity: 99%

- Urine vs Cervical (CT and NG in women)
 - Sensitivity: 79%–87%
 - Specificity: 99%

- Urine vs PC urethral (CT and NG in men)
 - Sensitivity: 88% –92%
 - Specificity: 99%

Bottom line...

- Urine screening in women has poor sensitivity¹
- SCVS are equivalent in sensitivity and specificity to those collected by a clinician, and this screening strategy is highly acceptable among women²
- Urine screening is considered acceptable for CTNG screening in men

1. CDC Recommendations for the Laboratory-Based Detection of Chlamydia trachomatis and Neisseria gonorrhoeae — 2014. Recommendations and Reports. March 14, 2014 / 63(RR02);1-19

2. Masek BJ, Arora N, Quinn N, et al. Performance of three nucleic acid amplification tests for detection of Chlamydia trachomatis and Neisseria gonorrhoeae by use of self-collected vaginal swabs obtained via an Internet-based screening program. J Clin Microbiol 2009;47:1663–7. PMID:19386838 <https://doi.org/10.1128/JCM.02387-08>

Why Is Screening So Important??

Bottom line – Most patients are unaware they even have an infection!

Even when a woman has symptoms, they are often so mild and nonspecific that they are mistaken for a bladder or vaginal infection

**Asymptomatic
Chlamydia**

75%

**Asymptomatic
Gonorrhea**

50%

**Asymptomatic
Trichomonas**

80%

CDC Screening Guidelines for CTNG in Women

Screening Compliance with CDC Recommendations is Dismal in the US!!

- Age itself is a major risk factor for STIs¹
- Routine screening for chlamydia and gonorrhea infection on an annual basis is recommended for all sexually active females aged 15–24²
- A national survey of youth aged 15–25 years found that most had never received an STI test; only 16.6% of females and 6.6% of males had been tested in the past 12 months
- USPSTF: Screening is associated with reduced risk of PID vs no screening¹

Take-home message

This population accounts for almost half of all new STD infections yearly!

1. US Preventive Services Task Force. Screening for Chlamydia and Gonorrhea: US Preventive Services Task Force Recommendation Statement. JAMA. 2021;326(10):949–956. doi:10.1001/jama.2021.14081

2. Sexually transmitted disease surveillance 2019. Centers for Disease Control and Prevention. Reviewed 2021. Accessed July 28, 2021. <https://www.cdc.gov/std/statistics/2019/default.htm>

Screening for Other Women at Increased Risk of CTNG

Risk factors for women 25 years or older (who should also be screened annually):

- They have a new partner
- More than one sex partner
- A sex partner with concurrent partners
- A sex partner who has an STI
- Practice inconsistent condom use
- Have a previous or coexisting STI
- Have a history of exchanging sex for money or drugs
- Have a history of incarceration

Take-home Reminder!

- Screen based on age and risk factors, not just symptoms or exposure!
- Chlamydia infections are asymptomatic in 70-75% of females
- Gonorrhea infections are asymptomatic in 50% of females

CDC CTNG Screening Guidelines for Men

Men Who Have Sex with Women

Screening young men should be considered in high prevalence clinical settings such as:

- Communities with high prevalence rates of CTNG (what is your prevalence??)
- Adolescent clinics
- Correctional facilities
- STI/sexual health clinics
- Recent travel history with sexual contacts outside of the US

Men Who Have Sex with Men

- CTNG testing at least annually for sexually active MSM at sites of contact (urethra, rectum), regardless of condom use
- Add Pharyngeal GC testing at least annually for sexually active MSM with pharyngeal sites of contact
- Every 3 to 6 months if at increased risk (i.e., MSM on PrEP, with HIV infection, or if they or their sex partners have multiple partners)

Opt-out Testing

Can minimize screening barriers by normalizing difficult conversations and reducing the stigma many young patients associate with STI testing

How can we improve Screening Rates?

- Designate a **Clinical Champion!**
- Offer **Opt-out testing** to high-risk groups - Standing orders
- **Express** visits
- Use EMR clinical decision tools
- Lobby Insurers for **carve out payments** for CDC/USPSTF recommended screenings
- Because of a high likelihood of reinfection, the CDC recommends **re-testing** all patients diagnosed with CTNG infection 3 months after treatment

Urgent Care Tip

Schedule these follow up testing appointments when delivering results

“Presumptive” and “Empiric” Treatment of STIs

Long delays in test results for samples sent to central labs, as well as poor follow-up, often lead clinicians to treat before a lab result is obtained

Empiric Treatment



Treatment for patients who have a proven or suspected infection, but the responsible organism(s) has or have not yet been identified

Presumptive Treatment



Treatment begun on the basis of an educated guess and in the absence of laboratory confirmation of disease

Syndromic Treatment




Treatment occurs before confirmation of a definitive diagnosis

Problem: NG and CT infections in women are often asymptomatic. Relying on signs and symptom to treat NG and CT often leads to under-treatment in women

By contrast: result- or data-driven treatment is treatment guided by, or informed by, a test result

A Real Conundrum...

| SETTING | LOCATION | % OVER-treated | % UNDER-treated |
|--|-----------------------------------|----------------|-----------------|
|  Emergency Dept | Chicago, IL | 21.6% | 43.4% |
| | Inner city | 86% | 4% |
| | Urban academic | 46.7% | 43.8% |
| | St. Louis, MO (pregnant women) | 15.6% | 80% |
| | St. Louis, MO (women) | 67.5% | 87.5% |
| Urgent Care | Baton Rouge, LA | 87% | 12% |

33%

Under-treated
lost to follow up

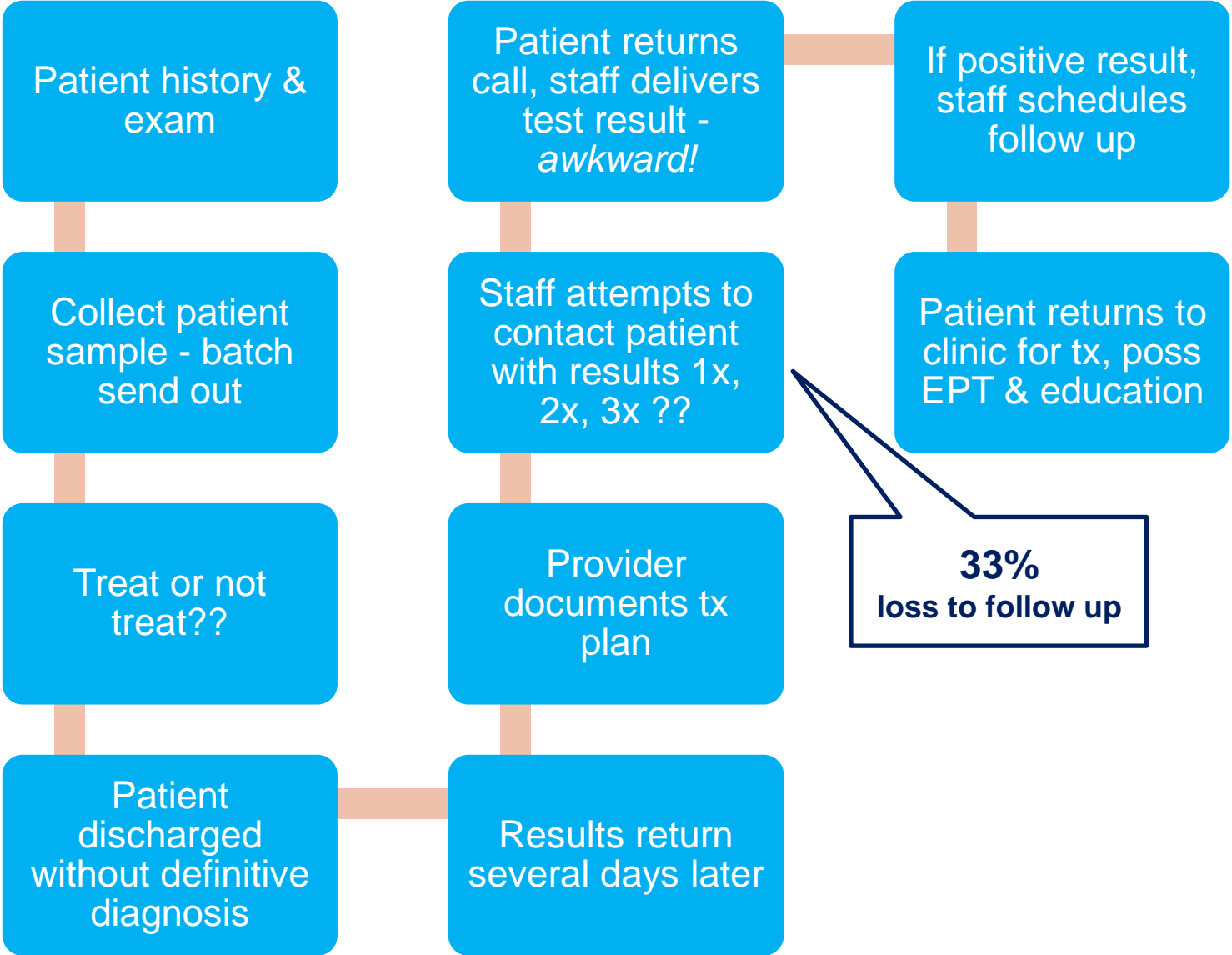
54%

Under-treated did NOT
return for treatment

Catch-22

To treat or not to
treat???

Traditional STI Testing



Patient history & exam

Collect patient sample - batch send out

Treat or not treat??

Patient discharged without definitive diagnosis

Patient returns call, staff delivers test result - *awkward!*

Staff attempts to contact patient with results 1x, 2x, 3x ??

Provider documents tx plan

Results return several days later

If positive result, staff schedules follow up

Patient returns to clinic for tx, poss EPT & education

33%
loss to follow up

No EPT!
limited patient education!

Patient/Provider Challenges in STI Testing

- Until recently there have been no FDA approved rapid POC tests for STIs, forcing Providers to make treatment decisions without benefit of test results
- Missed opportunity for patient education without definitive diagnosis
- Poor follow-up rates – as high as 33% in some studies (unable to contact, no access to portal, socioeconomic factors, etc.)
- Provider continuity issues
- Relaying positive STI testing results over the phone is not ideal

Operational Challenges in STI Testing

- Potential for notification errors with delayed results
- Delayed results can go missing...
- Due to delayed testing results (48hrs+), staff must notify patients when results return
- Time burden of results notification (multiple calls, certified letters, etc)
- Time burden of scheduling follow-up appointments for Tx if/when patient is contacted (Don't forget - ceftriaxone is IM – can't call in an Rx)
- Multiple providers may become involved in follow up and treatment decisions
- Time spent on documentation
- Relaying positive STI testing results over the phone is not ideal

Public Health Challenges in STI Testing

- Delay in treatment for eventual lab positive patients while awaiting test results who are not treated presumptively can lead to disease progression and complications
- Transmission may continue while waiting for test results
- Missed opportunity for expedited partner(s) treatment (EPT)
- Patients treated presumptively with antibiotics are placed at risk for antibiotic complications unnecessarily
- Unnecessary antibiotics may contribute to antibiotic resistance

Consequences of Over-Treatment of STI

- Unnecessary exposure of the patient to antibiotic with possible **adverse effects**
- Selection of **antibiotic-resistant microorganisms** thus contributing to the further emergence of antibiotic-resistant infections
- **Ineffective** clinician-patient dialogue because discussion will be biased by an incorrect diagnosis
- **Inefficient clinic workflow:** staff needs to contact patient by phone (often problematic) and schedule return appointment for the correct treatment
- **Reduced** patient-satisfaction
- **Reduced** clinician-satisfaction

Consequences of Under-Treatment of STI

- **Public health concern**, creating a pool of untreated patients at risk of spreading the infection
- **Delayed** treatment may result in complications of an untreated progressive infection (details on next slide)
- **Delayed** expedited partner treatment
- **Reduced** opportunity for result-enabled, face-to-face clinician—patient dialogue

Antibiotic Stewardship Implications

- Presumptive/Empiric treatment: may lead to increased **antibiotic resistance**
- **Unnecessary** antibiotics promote the transmission of genes for antibiotic resistance between gut bacteria
- Antibiotics directly induce the expression of key genes that affect the **stress response**
- Antibiotics can also eliminate antibiotic-susceptible organisms, allowing resistant organisms to **proliferate**

Known and potential harms of antibiotic overprescribing¹

| Known harms | Potential harms |
|--|------------------------|
| Antibiotic-associated diarrhea | Increased asthma |
| <i>Clostridium difficile</i> colitis | Increased obesity |
| Tendon rupture (quinolones) | Impaired immune system |
| Long QT syndrome (macrolides and others) | Mental health effects |
| Renal compromise | |
| Allergic reactions | |

Take Home Message:

Provider statements about the potential harm of antibiotics to the individual have a greater impact than statements about resistance or societal impact of antibiotics¹

1. Fiore, D., et al, Antibiotic Overprescribing: Still a Major Concern. Fam Pract. 2017 December;66(12):730-736

Advantages of Rapid STI Point-Of-Care Tests

CLINICAL advantages

- Enables result-driven, appropriate treatment within the span of a single clinic visit
- Reduces probability of untreated STI infection progression
- Reduces probability of onward transmission
- Facilitates patient education by providing an accurate diagnosis before the patient leaves the clinic
- Enables the prompt treatment of the diagnosed person's sexual partner(s) via the CDC-sanctioned EPT program

OPERATIONAL advantages

- Improves clinic workflow - increases the efficiency of clinic staff
- Likely positively impacts clinic's cost effectiveness
- Increases patient and physician satisfaction by providing a clinician with an accurate diagnosis during the initial visit

FINANCIAL advantages

- Time = Money
- Patient treated immediately without need for 2nd clinic visit - free up schedule to see other patients
- Increased E/M level office visit
- Will a second visit for the same diagnosis be reimbursed?
- Sexual partner(s) may be referred to clinic for testing/treatment
- No more follow up calls

Take Home Points!

Half of all new STDs are in young people aged 15-24

80% of STI cases are now diagnosed in non-STI clinics (Hello Urgent Care!)

CT is asymptomatic in 75% of women, GC is asymptomatic in 50% of women

Compliance rates with CDC CTNG screening recommendations in the US are dismal!

Self-collected vaginal swabs are preferred for CTNG testing in women

Urine samples are the CDC sample of choice for men

Doxycycline treatment of choice for CT — Azithromycin removed as first-line therapy

Ceftriaxone 500 mg now recommended for GC treatment — azithromycin removed

Rapid, POC tests for STIs can reduce over/under treatment of STIs and become a new tool for antibiotic stewardship

Q & A

Glenn Harnett

glenn@no-resistance.com