SEXUALLY TRANSMITTED INFECTIONS 2022

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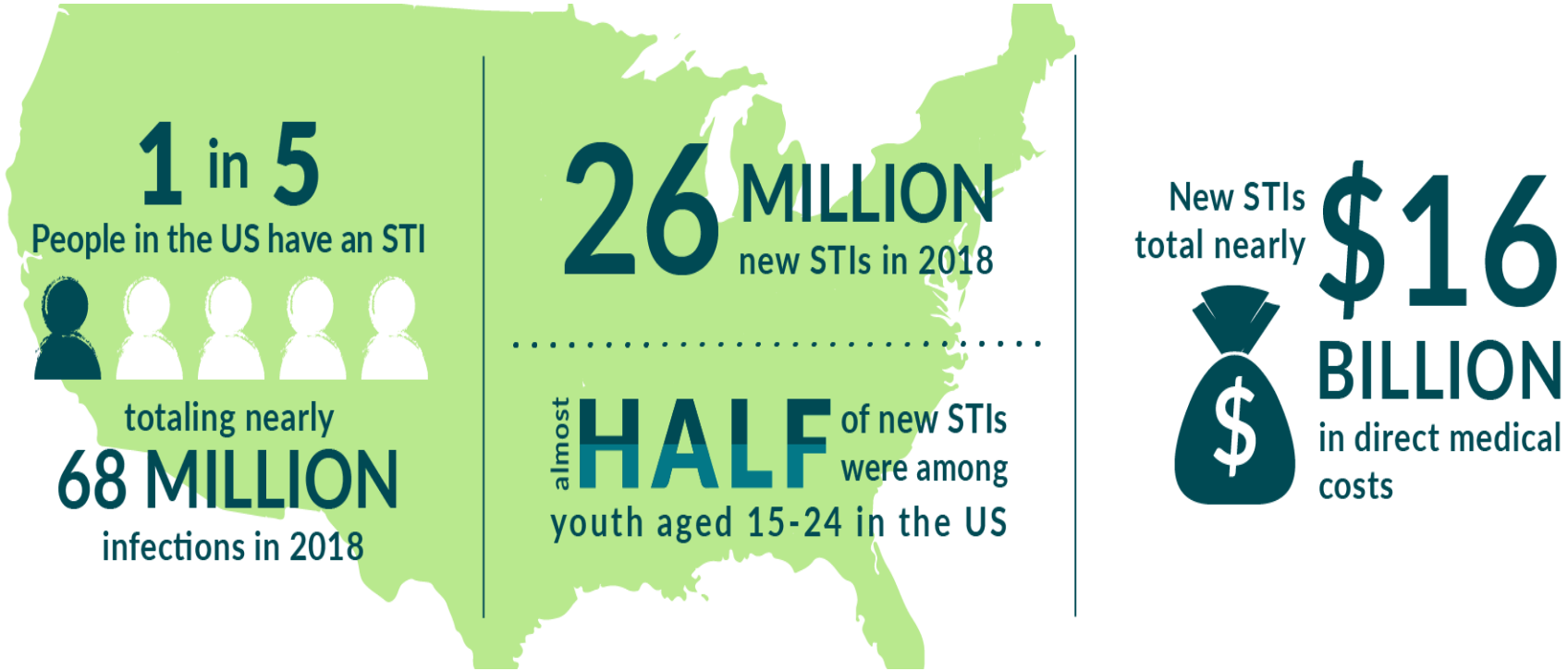
Learning Objectives

- To understand how to evaluate and screen patients for sexually transmitted infections
- Review the new CDC guidelines for treating Gonorrhea and chlamydia
- How do you diagnose and treat genital mycoplasma infections?
- To learn the causes of genital ulcer disease and their various clinical presentations
- To review the clinical presentations and treatment of syphilis

DISCLOSURES

- Bay Lyme Foundation
- Piction Health
- GLG

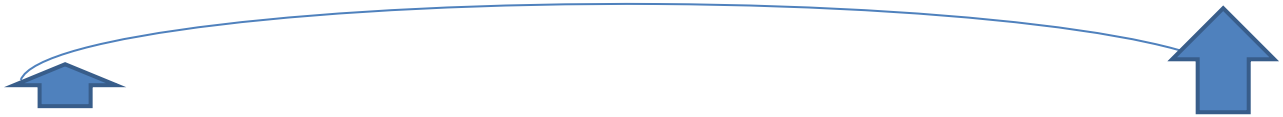
- On any given day in 2018, 1 in 5 people had an STI



CDC.Gov

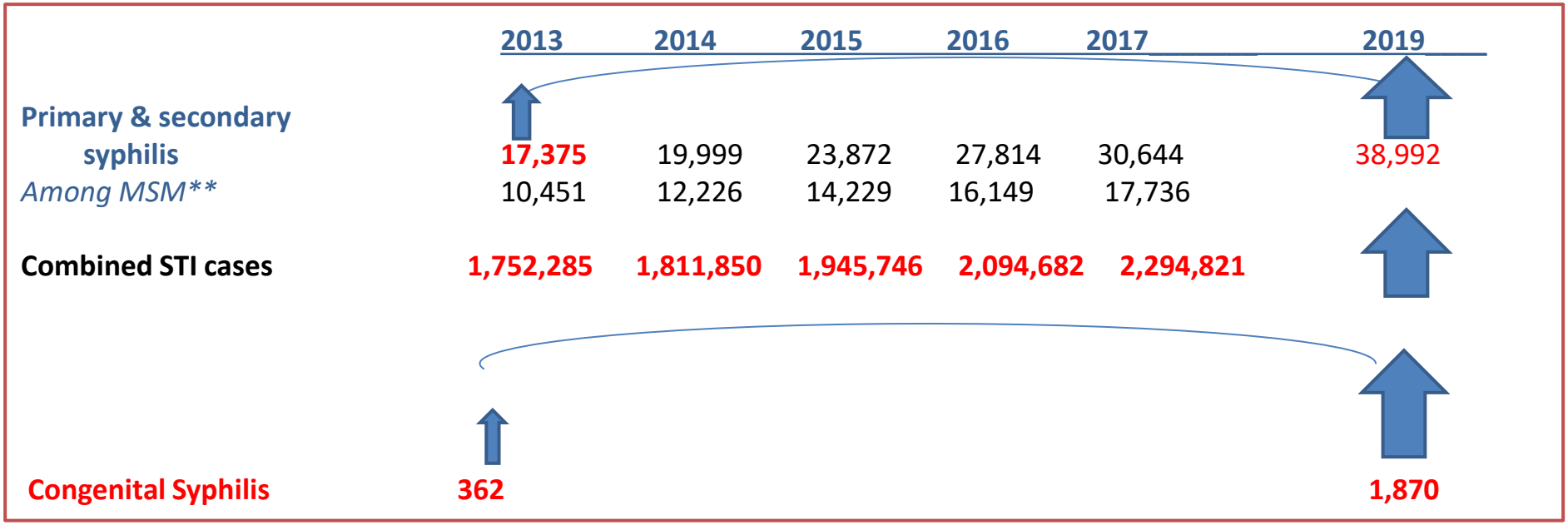
STD DIAGNOSES AMONG KEY U.S. POPULATIONS, 2013-2019

	2013	2014	2015	2016	2018	2019
Chlamydia	1,401,906	1,441,789	1,526,658	1,598,354	1,758,668	1,808,703
Among women (aged 15 to 24)	715,983	709,170	724,709	735,027	779,367	
Gonorrhea	333,004	350,062	395,216	468,514	583,405	616,392
Among women	163,208	162,608	173,514	197,499	241,074	
Among men	169,130	186,943	221,070	270,033	341,401	



- cdc.gov/nchhstp/newsroom.
  Adapted from U.S. Dept of Health & Human Services, CDC

STD DIAGNOSES AMONG KEY U.S. POPULATIONS, 6-YEAR TREND



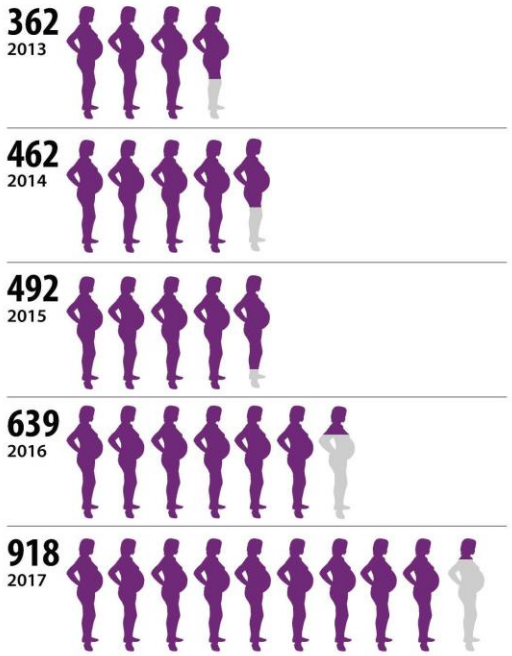
cdc.gov/nchhstp/newsroom
Adapted from U.S. Dept of Health & Human Services, CDC
Sexually Transmitted Disease Surveillance 2019/ CDC

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

Congenital syphilis is a tragic disease that can cause miscarriages, premature births, stillbirths, or even death of newborn babies.

In the past 4 years, cases of congenital syphilis have

MORE THAN DOUBLED



80%

The chance of a mother passing syphilis onto her unborn baby if left untested or untreated.

Source: U.S. Centers for Disease Control and Prevention

Factors Contributing to Rise in STIs

Pre-COVID

- Ease of Global Travel {  2020}
- Prevention of HIV PrEP (?)  Condoms
- Rise of Geosocial apps
- Impact of COVID-19 - Reduced STI services/Reporting

Pre – Covid vs Post –Covid

- Stay at home order went in place --Early April – Early May 2020
- Initial Drop in reported STI cases
  - Chlamydia 54 % lower c/w 2019 reported cases;
  - GC was 33 % lower than 2019
- Stay at home orders stopped in early June
- By Mid June, 2020 Syphilis and gonorrhea exceeded 2019 cases

❖ Return to pre-Covid volumes once stay at home orders were lifted.

References

https://www.cdc.gov/std/treatment-guidelines/default.htm

- CDC, Sexually Transmitted Diseases Treatment Guidelines, 2021

- https://www.cdc.gov/std/treatment-guidelines/STI-Guidelines-2021.pdf

Want to know more about STDs?
There's an app for that.

CDC STD Treatment Guidelines App for Apple and Android

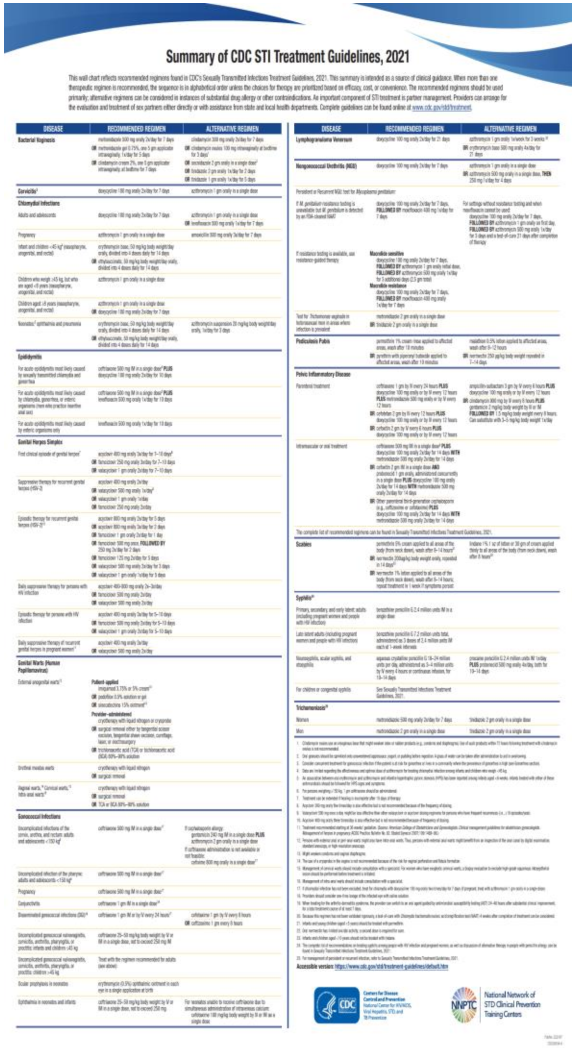
Available now, **FREE!** (accept no competitors)

Search "STD Treatment Guidelines" in the app store

National Network of STD Clinical Prevention Training Centers

STD Clinical Consultation Network

Treatment guidelines

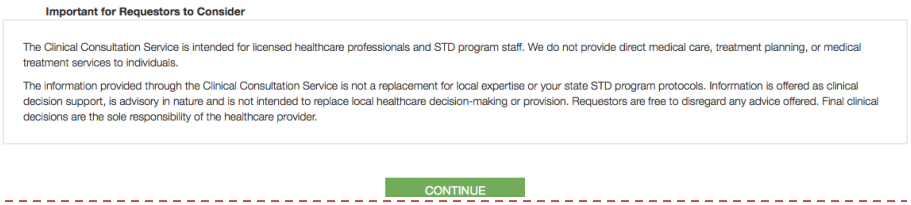

Summary of CDC STI Treatment Guidelines, 2021

STD Clinical Consultation Network (STDCCN)

- Provides STD clinical consultation services within 1-3 business days, depending on urgency, to healthcare providers nationally
- Your consultation request is linked to your regional PTC's expert faculty
- We are just a click away!
- www.STDCCN.org

National Network of
STD Clinical Prevention
Training Centers

STD Clinical Consultation Network



https://www.cdc.gov/std/healthcomm/the-facts.htm

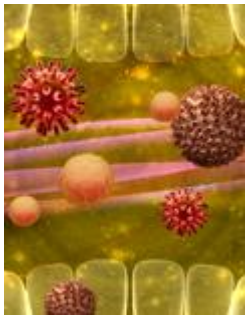
https://www.cdc.gov/std/healthcomm/fact_sheets.htm

Basic **information about STDs in plain lang**uage.
NEW! Easy print 8½ by 11 version for desktop printing available on
Individual brochure pages

Genital Herpes
Basic | Detailed
Also in: Español (Spanish)中文 (Chinese)
Kreyòl (Haitian Creole)
Русский (Russian)
Tiếng Viêt (Vietnamese)

Bacterial Vaginosis
Also available in Spanish (Español).

STD Risk and Oral Sex



Chlamydia
Also available in Spanish (Español).

Sexually Transmitted Pathogens

Bacteria:	N. gonorrheae, H. ducreyi, K. granulomatis
Spirochetes:	Treponema pallidum
Chlamydia:	C. trachomatis
Mycoplasma:	M. hominis, M. genitalium, U. urealyticum, U. parvum
Viruses:	HSV, HPV, Molluscum, HIV, Hepatitis A, B, C, Adenovirus, CMV, Ebola, Zika
Protozoa:	T. vaginalis, E. histolytica, G. lamblia
Fungi:	C. albicans

True or False ?

Most people with a sexually transmitted infection will have symptoms and seek medical care

- The vast majority of people with an STD have NO recognizable symptoms

Case

- 27 year old man goes to urgent care because of a generalized erythematous, maculopapular rash for about a week.
- Told he had allergic reaction and given diphenhydramine.
- He comes back to see you because the rash is still there.
- What do you do?

Taking a Sexual History:

Who Would You Ask?

a) Heterosexual college man in a monogamous relationship with a woman for 3 years?

b) 50 year old housewife with chronic fatigue syndrome?

c) 55 year old married female executive with recurrent urinary tract infections?

d) 65 year old business man with osteomyelitis?

e) 25 year old man who has sex with men?

f) all of the above

Taking a Sexual History

1. Do you have sex with **men, women, or both**?
2. How many different people do you have sex with?
3. How many **different people** have you had sex with in the past 6 mos? A year? Lifetime?
4. **Did you put your mouth on someone's penis, rectum, vagina?**
5. **Does someone put his penis in your vagina? Mouth? Rectum?**

Taking a Sexual History

6. Do you birth control? What kind? Do you use it all the time?
7. Do you use condoms? With every person? All the time? At the start?
8. Have you ever had a sexually transmitted infection?
9. Have you had sex for money, housing, food?
10. Use of drugs – Methamphetamine, Others? ETOH?
11. Vaccines - Hep B, Hep A, HPV, ? Meningococcal

Special populations – MSM

- *Assess the sex of sexual contacts for all male patients*

- Screen at least annually;
- Screen more frequently (**q 3 months**) if high risk behavior
- - **HIV testing**
    - **If HIV status unknown or negative & either the patient or partner has had more than one sex partner since previous test**
  - **Syphilis** serology
  - **Urethral GC/CT** (urine NAAT preferred)
  - **Rectal GC/CT** (rectal NAAT preferred)
  - **Pharyngeal GC /CT** (Pharyngeal NAAT)

Special populations – MSM - 2

- Anal cancer screening –
  - DARE (digital anorectal exam); data is insufficient for routine testing: *"some clinics/centers perform anal cytology"*
- HSV 2 – using type specific serologic tests
- **HCV – Increased risk with receptive anal intercourse**
  - Initial dx of HIV
  - High-risk sexual behavior,
  - Concomitant ulcerative STDs
  - STD proctitis
- **HBsAg**
- Vaccines: **Hep B, Hep A, HPV,**
  - Meningococcal vaccine

Special Populations

- Adolescents
- Pregnancy
- Seniors
- Woman who have sex with women (WSW)
- Transgender
  - "Identify with a sex that differs from that they were assigned at birth"
  - STD/HIV risk based on current anatomy and sexual behaviors
    - Trans-man: may still have vagina/cervix

Case

25 year old man complains of 3 days of dysuria, discharge, no frequency.

On further questioning, he tells you that he has sex with both men and women. He has no other symptoms and otherwise feels well.

What other questions do you want to ask?

What tests do you want to send?

URINE TESTING IS NOT ENOUGH

Prevalence of GC/Chl

	Rectal GC %	Rectal Chl %	Pharyngeal GC%	Pharyngeal Chl%
Women	0.6-35.8	2-77.3	0-29.6	0.3-3.2
MSM	0.2-24	2.1-23	0.5-16.5	0-3.6
MSW	0-5.7	0-11.8	0.4-15.5	0-22

Literature review
Chan PA et al
Infect Dis Obstet Gynecol. 2016

Pharyngeal/Rectal GC

- **Majority are *asymptomatic***

- Prospective study in MSM 2001-2003
- Screened every 6 months
- Pharyngeal GC was asymptomatic in 92%

Morris SR et al. Clin Inf Dis; 2006

Urethritis

Gonorrhea (N. gonorrheae)

N. meningitidis – urethral/rectal

NGU

- C. trachomatis 15-40%
- M. genitalium 15-25%
- Ureaplasma urealyticum, Ureaplasma parvum,
- M. hominis, ?Other mycoplasmas
- T. vaginalis
- HSV2, HSV1
- Adenovirus
- Other pathogens? Case reports/outbreaks
  - *Haemophilus influenzae* and *Haemophilus parainfluenzae Corynebacterium propinquum, Kurthia gibsonii*, *Corynebacterium glucuronolyticum, Corynebacterium striatrium*, *Aerococcus urinae*, and *Neisseria elongata*

Urethritis

- Dx:
  - ≥ 2 WBC/oil immersion (prev ≥ 4-5 WBC)
- Methylene blue or gentian violet stain can be used in addition to Gram Stain of urethral secretions and 1st void – leukocyte esterase test
- Test all men with NAAT for GC/CT
- Test for Trich in areas with high prevalence (less common in MSM)
- Treat presumptively for both GC/CT unless test results are immediately available
- Patients dx with GC/CT/TV should be retested in 3 mos

- Persistent/Recurrent NGU:
  - ? Reinfection
  - ? Prostate
  - ? M. Genitalium
  - MSW: consider rx for TV
    - Metronidazole/tinidazole

Cervicitis

- **> 10 WBC in vaginal fluid in the absence of trichomoniasis**

  ? association with Chlamydia/GC
- Rule out upper tract infection: endometritis/PID
- Test for *C. trachomatis* and *N. gonorrheae* (NAAT)
- **Rx presumptively** for CT and GC if at risk or f/u cannot be guaranteed or results of NAAT testing not available
- Assess for BV and *T. vaginalis*
- ?Utility of HSV testing
- Retest in 3 mos for GC/CT/TV if infected
- Rx sexual contacts exposed within previous 60 days
- **Persistent cervicitis**
  - **Consider M. genitalium**

Testing for GC & Chlamydia

- Men- first catch urine
- Women- vaginal swabs
  - Self-collected **vaginal swab** are equivalent to provider collected NAAT
- Oropharyngeal CT/GC
  - Generally asymptomatic
  - Oropharyngeal C. trachomatis can be sexually transmitted to genital site
- Rectal GC/Chlamydia
  - Self-collected rectal swabs are comparable to clinician-collected

Treating Uncomplicated Urethral & Cervical GC -1

- ***Increased MIC to cephalosporins***

- Ceftriaxone **500 mg** IM (**1g** IM >330 lbs, 150 kg)

(99.2% urogenital/rectal; 98.5% pharyngeal)

*Cefixime – **800 mg***	*(97.5%-urogenital; 92% pharyngeal)*
Cefpodoxime 400 mg	*(pharynx: only 70%)*
Cefuroxime – not adequate	*(95% urogenital/rectal; 57% pharyngeal)*

******Plus Treatment for Chlamydia if not ruled out by testing**

Doxycycline 100 mg po bid X 7 days

- Test of cure recommended for those with pharyngeal GC
- ALL patients should be retested within 3 mos; or when they return next within 12 mos

Chlamydia

- Treatment

  - Doxycycline 100 mg po bid X 7 days - 1st line Rx **
    - Efficacious against all 3 sites
    - ? May be more efficacious for rectal infections than azithromycin
      - (Doxy 100%, 74% azithro – Dombrowski et al. Clin Infect Dis; 2021)

  - Azithromycin 1 g po X 1 dose
    - 1st line in pregnancy
    - Settings where adherence may be an issue

Treatment of GC Infections
Ceftriaxone Allergy or Abx Resistance

- **Gentamicin** 240 mg IM/ **azithromycin 2gm**

  100% genital GC infections

Combinations cured 100% of infections of the **throat and rectum.**
Gentamicin alone is inadequate to clear GC from the pharynx

(CID 2020; Nov 71[5])

Adverse effects: mostly gastrointestinal issues.

Test of Cure? -- Yes, in 1 week

If Test of Cure is positive – perform culture and antimicrobial testing

(NIAID) ClinicalTrials.gov Identifier: NCT00926796

Gonorrhea - Superbug

- New Antibiotics

  Zoliflodacin (ETX0914)

  - Different mechanism of action than other antibiotics available.
  - Single-dose oral therapy
  - 96% Urogenital (2g, 3g)
  - 50% pharyngeal (2g), 82% pharyngeal (3g)

Stephanie N. Taylor, M.D., et al. N ENGL J MED 2018; 379:1835-45.
DOI: 10.1056/NEJMOA1706988

Gepotidacin - triazaacenaphthylene bacterial type II topoisomerase inhibitor

- 96% urogenital (1500 mg /3000 mg)

Stephanie N. Taylor Clin Infect Dis. 2018 Aug 15; 67(4): 504–512

- Enhanced Monitoring for resistant strains
- Meningococcal Serogroup B outer membrane vesicle protein vaccine MeNZB (Bexsaro): associated with reduced rates of gonorrhea.

If you've been diagnosed with an STD, you may be able to get treatment for your partner, too.

If you've been diagnosed with chlamydia or gonorrhea, the first step is to **get treatment.**

But did you know that **you may be able to get treatment for your partner, too?**

Talk to your doctor. They may be able to give you medicine or a prescription for your partner — even without seeing them. This is called **expedited partner therapy (EPT)** or patient-delievered partner therapy (PDPT), and it's available in most states.

With EPT:

PRESCRIPTION Rx

- ☑ Your partner can get treated quickly — without having to go to the doctor first
- ☑ You'll be protected from your partner passing the infection back to you
- ☑ Neither of you will pass the infection on in the future

Why does my partner need treatment?

Without treatment, your partner could pass the STD back to you. Keep in mind that many people with chlamydia and gonorrhea have no signs or symptoms, so your partner may have the STD and not know it. Left untreated, chlamydia and gonorrhea can cause serious health problems.

If you've been diagnosed with chlamydia or gonorrhea, **talk to your doctor** to find out if EPT is an option for you and your partner.

To learn more about how you can prevent STDs, visit cdc.gov/std/prevention.

Centers for Disease Control and Prevention
National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

Partner Services

- Encourage patients to have their sexual contacts evaluated and treated.
- In addition to the 1^{o} "partner", ALL sexual contacts to an STD should be treated.
- **Both persons should be treated concurrently.**
- **Offer EPT to heterosexual patients and MSM with chlamydia or gonorrhea infection** when it cannot be assured that all sexual contacts in the preceding 60 days will be treated.
- If > 60 days has passed since the patient has had sex, treat the most recent sexual contact/partner
- **Providing patients with appropriately packaged medication to give to their sexual contact** is preferred when possible.
- Medication or prescriptions should be accompanied by treatment instructions and appropriate warnings
- PDPT /EPT is now recommended for MSM

(CDC, STD Treatment Guidelines, 2021)

MYCOPLASMAS

- Smallest self - replicating bacteria
- 4 are known to be sexually transmitted

- Ureaplasma urealyticum

  Ureaplasma parvum

  Mycoplasma hominis
  - Culture/PCR : Vaginal, endocervical, urine, semen, prostatic fluid

- Mycoplasma genitalium – NAAT/PCR
  - Difficult to culture

Mycoplasma Genitalium

- 15-20% of NGU
- 30% of persistent NGU
- + epididymitis – limited data
- Rectal infection - Rarely causes rectal symptoms
- Pathogenic role in women not clearly defined
  - Women are asymptomatic
  - 10-30% of women with clinical cervicitis
  - More common in women with cervicitis
  - More often found in cervix/endometrium of women with PID than without PID
  - Evidence suggests can cause PID (less common than CT)
  - Preterm delivery, spontaneous abortion

Mycoplasma Genitalium (identified 1980)

- Difficult to grow
  - Slow growing; weeks to months
  - Done in only certain labs
- PCR/TMA
  - Urine, urethral, vaginal, cervical swab/tissue bx
  - Done in some centers/labs
- New NAAT - FDA Approved
  - Aptima *Mycoplasma genitalium* Assay (Hologic Inc.)
  - 11,744 samples tested
  - >90% from vaginal, male urethra, male urine,
  - 77.8% women urine, 81.5% endocervical
- Consider in patient with persistent or recurrent urethritis /cervicitis/PID

M. Genitalium – Antibiotic Sensitivity

- Doxycycline X 7 days 31%
- Azithromycin 1 g X 1 40-85%
- Moxifloxacin 90% (8.6% resistance/Australia; 4.5% UK;6%France)

  400 mg po daily X 7-14 days

- Pristinamycin (European guidelines/Australia): 1 g qid X 10 days
  - 75% Efficacy in strains resistant to both fluoroquinolones and macrolides

    (Doses used in study: 2g, 3g + doxy, or 4g)
- lefamulin(Xenleta)
  - Pleuromutilin antibacterial; inhibits bacterial protein synthesis

Murray GL, Bradshaw CS, Bissessor M, et al. Increasing Macrolide and Fluoroquinolone Resistance in Mycoplasma genitalium *Emerging Infectious Diseases*. 2017;23(5):809-812. doi:10.3201/eid2305.161745.

Read T, et al. Use of Pristinamycin for Macrolide-Resistant Mycoplasma genitalium Infection. *Emerging Infectious Diseases*. 2018;24(2):328-335. doi:10.3201/eid2402.170902

Mycoplasma genitalium

Macrolide sensitivity testing is not readily available

Treat *M. genitalium* detected by an FDA-cleared NAAT:

Doxycycline 100 mg orally 2 times/day for 7 days,

Followed by

Moxifloxacin 400 mg orally once daily for 7 days

- **If Macrolide sensitivity is available:**
- **If *macrolide sensitive:* Doxycycline** 100 mg orally 2 times/day for 7 days,
  followed by **azithromycin** 1 g orally initial dose, followed by 500 mg orally once daily for 3 more days (2.5 g total)
- **If macrolide resistant: Doxycycline** 100 mg orally 2 times/day for 7 days
  followed by **moxifloxacin** 400 mg orally once daily for 7 days
- If not able to take moxifloxacin:
  - **Doxycycline** 100 mg orally 2 times/day for 7 days,

    Followed by azithromycin (1 g orally on day 1 followed by 500 mg once daily for 3 more days)
  - And a test of cure 21 days after completion of therapy
- Can test sexual contact and if positive – treat with same regimen as patient

Mycoplasma genitalium – Extragenital Infections

- Limited data

- Rectal swabs MSM that were positive for CT/or GC
  - Rectal Mgen 13% (27/212) with Chl
    14% (29/212) with GC

- Pharyngeal swabs
  - Pharyngeal Mgen 2% (8/464)

Latimer RL, et al; Sex Transm Infect 2020

Genital Ulcers

- Syphilis *(Treponema pallidum)*
- Herpes simplex *(HSV-2, HSV-1)*
- Chancroid *(H. ducreyii)*
- LGV *(C. trachomatis L1-L3)*
- Donavanosis *(K. granulomatis)*
- EBV, HIV
- Behcet's
- Fixed drug reactions

Sensitivity of Serologic Tests in Untreated Syphilis

	Stage	Of	Disease	
	Primary	Secondary	Latent	Late
VDRL	59-87	100	73-91	37-94
FTA-ABS	86-100	99-100	96-99	96-100
MHA-TP	64-87	96-100	96-100	94-100

From: Jaffle, in: Holmes, 1984

Genital Ulcer Disease

- **Rx presumptively if syphilis is suspected at initial visit (diagnostic tests should be sent)**
  - **Most MSM with ulcer**
- Rx presumptively if first episode of genital HSV is suspected
- **HIV** testing should be performed on **all** patients with genital/perianal ulcers
- Repeat syphilis serology & HIV test 3 months after dx of chancroid if initial test was negative

Genital HSV

- HSV2 >> HSV1
- Increased % of anogenital infection is due to **HSV 1**
  - Young women/MSM
- **Most transmission is by people who are unaware of their infection**
  - **PCR/Amplification testing** - Preferred over culture
  - Viral culture
- Serology: Type specific testing should be performed
  - glycoprotein G type specific assays (G1, G2)
    - HerpeSelect most commonly used
    - HerpeSelect may be Falsely Positive at low index values;
      - confirm with second test

Herpes Serology

- HerpeSelect® 1 ELISA IgG & 2 ELISA IgG (Focus Diagnostics)
- Herpeselect 1 and 2 Immunoblot IgG (Focus Tech, Inc.)
- Bio-Plex® 2200 HSV-1 & HSV-2 IgG (Bio-Rad Laboratories)
- EUROIMMUN® Anti-HSV-1 & Anti–HSV-2 IgG (Euroimmun)
- LIAISON® HSV-1 Type-Specific IgG & LIAISON® HSV-2 Type-Specific IgG (DiaSorin)
- ZEUS ELISA HSV gG-1 Test System & ZEUS ELISA HSV gG-2 Test System (Zeus Scientific)
- biokit HSV-2 Rapid Test (biokit)
- Trinity Biotech USA

HSV - Rx

- Multiple regimens for antiviral Rx of genital HSV
- Pregnancy
  - Acyclovir can be used safely in all stages of pregnancy or when breastfeeding when needed
- Pregnancy 36 weeks:
  - Suppressive rx
  - Acyclovir 400 mg po tid or Valacyclovir 500 mg bid
- HSV encephalitis – 21 days of IV acyclovir

Chancroid

- Prevalence has declined in US and worldwide
- Dx
  - Culture: special media
    - Sensitivity <80%
  - No FDA-cleared PCR
  - Some labs have developed and validated PCR test
- Rx
  - Azithromycin or ceftriaxone; single dose therapy
  - Some isolates with intermediate resistance to Ciprofloxacin or erythromycin have been reported
- Rx partners/contacts in past 10 days

Granuloma Inguinale - Rx

- Genital Ulcer – India, S. Africa, S. America
- DX – Biopsy of lesion
- Azithromycin 1 g po weekly or 500 mg po daily
  X 3 weeks or until lesions healed
  - (Alternative rx: doxycycline, ciprofloxacin 750 mg bid, erythromycin, trimeth/sulfa)
  - Additional antibiotic (gentamicin) can be given if no improvement within a few days of rx
- Pregnancy
  - Macrolide + gentamicin (if no improvement)

Lymphogranuloma Venerum – LGV

C. Trachomatis L1, L2, L3

- Genital Ulcers
- Outbreaks of proctocolitis in MSM
- Reactive arthritis can be complication
- Rectal infection can be asymptomatic
- Lymphadenopathy (Buboe)
- DX:
  - NAATs preferred test – rectal specimens (?type)
  - Serology:
    - MicroIF > 1:256; CF $\geq$ 1:64 (C. Trachomatis ab)
- RX:
  - Doxycycline 100 bid X 21 days
  - Erythromycin 500 mg qid X 21 days
  - ?Azithromycin 1 g weekly X 3 weeks – no data
  - Rx Partners: Exposure within 60 days before onset of patient's symptoms

Primary Syphilis

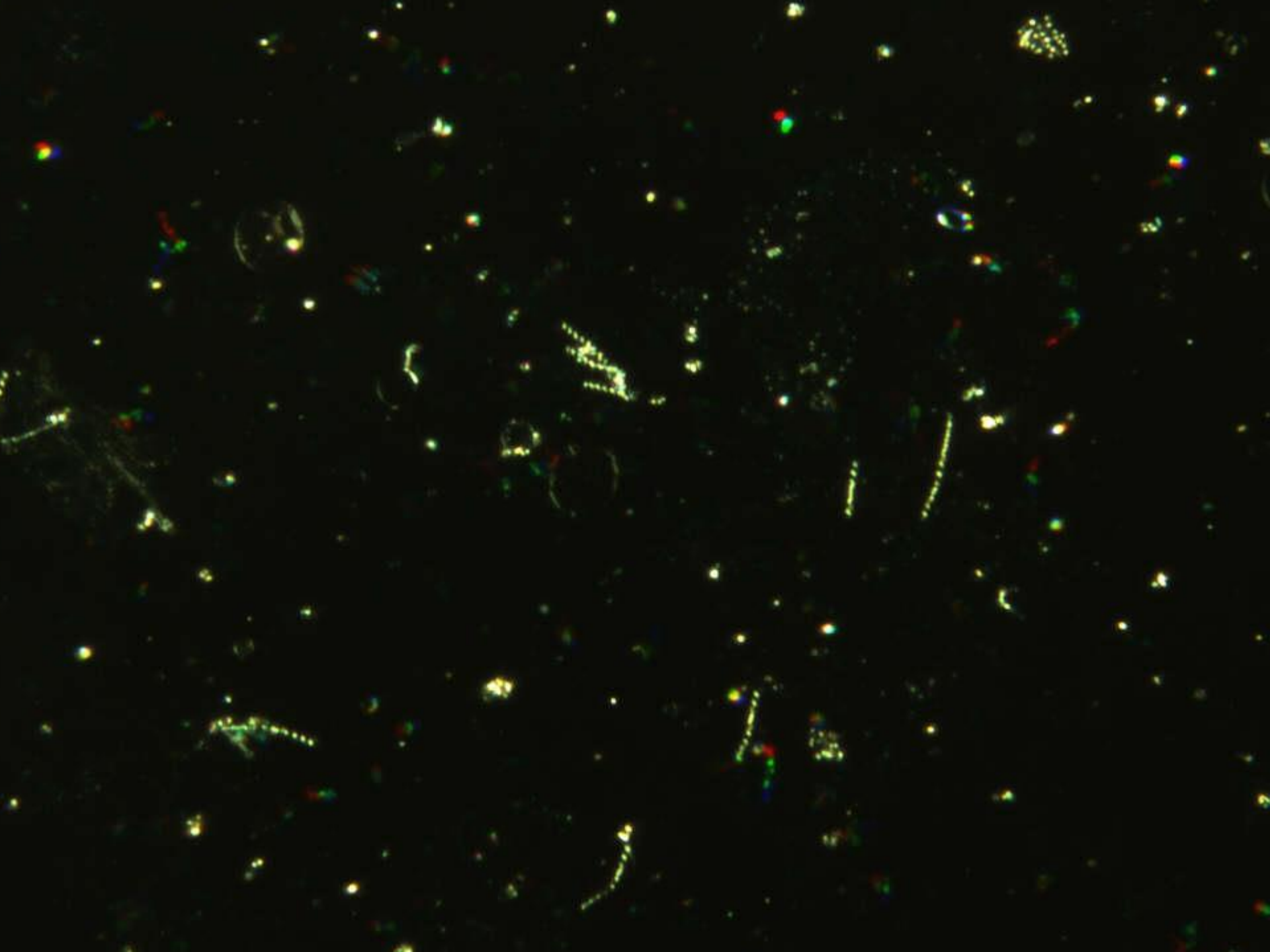
- Incubation period: 3-90 days
- The chancre: clean based, painless
  - Indurated ulcer begins as a papule
  - May be extragenital
  - May be multiple
  - Unnoticed 15-30%
- Heals spontaneously 1-8 weeks
- Regional lymphadenopathy often present
- Diff'l dx: HSV, chancroid, LGV, fixed drug eruption, granuloma inguinale, CA
- Dx: darkfield microscopy, serology

Secondary Syphilis

- Occurs 2-8 weeks after the chancre;
  - chancre may still be present
- Systemic symptoms are often present
  (fever, malaise, headache)
- Physical exam: generalized lymphadenopathy, mucous patches, hepatosplenomegaly, condylomata lata, alopecia,
  skin rash involves palms and soles, varies greatly

Syphilis-Stages

- PRIMARY
- SECONDARY
- LATENT <1 yr Early Latent; > 1 yr Late Latent
- TERTIARY:
  - CARDIOVASCULAR
  - GUMMA
  - NEUROLOGICAL



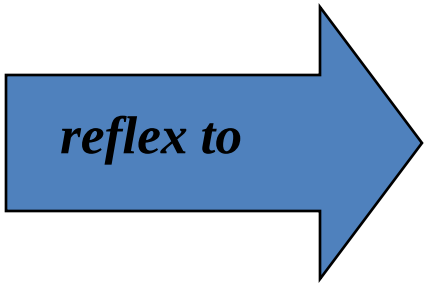
Serology

- **NONTREPONEMAL TESTS**
  - VDRL
  - RPR
  - ART
- **TREPONEMAL TESTS**
  - FTA-ABS
  - MHA-TP
  - TPPA
  - ELISA
  - TPI
  - HATTS

Syphilis Screening Paradigm

Treponemal tests
(i.e., EIA,CLIA
Captia,Trep-Chek, Trep-Sure,Liaison**)**

- **Specific to *TP***
- **Qualitative**
- **Reactivity persists over time**
- **Objective results**
- **No false negatives due to Prozone reaction**

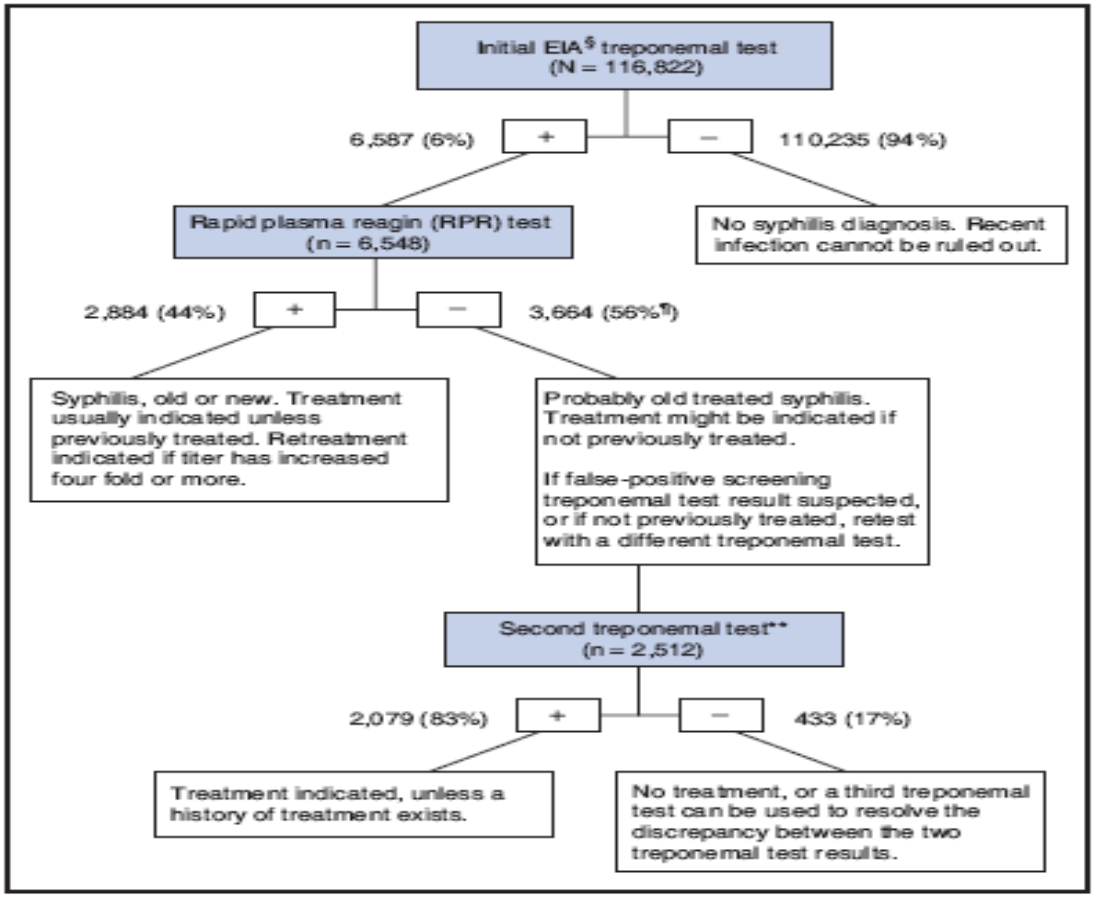


Non-treponemal tests
(i.e., RPR, VDRL)

- **Non-specific to *TP***
- **Quantitative**
- **Reactivity declines with time**

Adapted from: California STD/HIV Prevention Training Center and STD control Branch

FIGURE. Composite results of syphilis testing algorithms using treponemal tests for initial screening and likely interpretations* — four laboratories, New York City, October 1, 2005–December 1, 2006†



* One laboratory provided limited interpretation of the test results; the other three summarized the results without interpretation. No formal recommendations exist regarding the interpretation of results derived from testing algorithms using treponemal tests as the initial test.

† Using a convenience sample of 116,822 specimens. The four laboratories used different testing algorithms. Data shown are a composite of results from all four laboratories.

§ Enzyme immunoassay.

¶ Reactive with EIA treponemal test but nonreactive with RPR test.

** Using *Treponema pallidum* particle agglutination or fluorescent treponemal antibody tests.

MMWR; 2008

Diagnosis of Neurosyphilis

- Clinical presentation
- Positive CSF VDRL
- Elevated CSF protein
- Elevated CSF cell count (>4-5 WBC/mm^3)
  - ? Higher specificity in HIV + patient if WBC >20 /mm^3

- Positive CSF FTA-ABS is not specific for neurosyphilis
- Negative CSF FTA-Abs makes neurosyphilis unlikely
- ?PCR {positive in 42%; amplifying tpp47 – CID 2016:63(9): 1180-1186)}

Rx of Early Syphilis (Primary, Secondary, Early latent<1 Yr)

- ***Benzathine*** PCN G 2.4 million U IM once (CDC)

  Beware of confusion –
  Benzathine (Bicillin L-A) vs. Benzathine-procaine (Bicillin C-R)

Pregnancy administer a **second dose** after 1 week

Penicillin allergic:

- Tetracycline 500 mg qid x 14 days*
- Doxycycline 100 mg bid X 14 days*

*Not in pregnancy

- ?Ceftriaxone 1-2 grams daily X 14 days (close f/u)
- **Desensitization (pregnancy)**

Treat all contacts exposed in the preceding 90 days

****Jarisch-Herxheimer Reaction – 30-70% early syphilis (particular concern in pregnancy)**

Latent Syphilis >1 Yr Duration

Rule out neurosyphilis – Exam/?LP

- RX: Benzathine Penicillin G
  - 2.4 million u IM/week x **3** wks

Penicillin allergic patients

- Rule out neurosyphilis by exam and ??LP
- Tetracycline 500 mg qid x 30 days
- Doxycycline 100 mg bid X 30 days
- ? Ceftriaxone

Test for HIV; If neg - offer PrEP ; repeat HIV test in 3 mos

Rx of Neurosyphilis

- Aqueous crystalline Penicillin G

  4 million u IV q 4 hr x 10-14 days followed by
  Benzathine penicillin 2.4 million u IM weekly X 3wks

Or

- Aqueous procaine Penicillin G (only if unable to give IV PCN)

  2.4 million u IM daily + probenecid x 10-14 days followed by
  Benzathine penicillin IM weekly X 3 wks

- *Repeat LP after Rx is no longer recommended if serology falls properly*

Syphilis

- Pregnancy
  - Benzathine penicillin doses for late latent syphilis must be administered at 7 day intervals;
  - Restart series if a dose is missed or if it is more than 9 days after last injection

- Congenital Syphilis
  - Placenta of umbilical cord should be examined using specific staining (i.e. silver) or PCR test (if validated)
  - Infants with reactive nontreponemal tests should be followed to insure test returns to negative
  - Antibody titers should decline by 3 months and be nonreactive by 6 months if infant is not infected

Syphilis – Treatment of Contacts

- All contacts exposed to early syphilis within the preceding year should be TREATED
- Contacts of patients with syphilis of unknown duration with titers ≥1:32 should be TREATED
- Contacts of patients with late syphilis should be evaluated

Ocular Syphilis -

- **Screen for visual complaints** in any patient at risk for syphilis;
  Refer for immediate ophthalmologic evaluation

- All patients with syphilis should have HIV test done if not known to be positive

- A **lumbar puncture is no longer recommended if there are no other neurologic signs or symptoms**

- Ocular syphilis should be managed according to treatment recommendations for neurosyphilis (Aqueous crystalline penicillin G IV X 14 days + Benzathine penicillin 2.4 million u IM X 3 weeks

- Report cases to CDC (Specimens if available)

CDC, Nov 2021

- A 24 year old MSM presents with 2 week history of mucopurulent discharge from the rectum. He has had 2 contacts in the past 2 months, 1 of which is his partner. He uses condoms with his partner.
- His exam is noted for a 2 cm tender lymph node in the left groin, and some mucous/blood around the anus.

Proctitis, Proctocolitis, Enteritis

- Dx:
  - Rule out Cancer - Digital exam
  - Anoscopy and gram stain: PMNs
  - HSV: PCR/culture
  - GC: NAAT/culture
  - C. trachomatis - NAAT; (if positive-perform molecular PCR for LGV if available)
  - T. Pallidum - darkfield; serology
  - Other: Campylobacter, shigella, salmonella, Giardia lamblia, E. histolytica,

Immunocompromised:

Cytomegalovirus (CMV), Mycobacterium avium-intracellulare

Proctitis, Proctocolitis, Enteritis

- Rx:
  - **Ceftriaxone 500 mg IM once /doxycycline 100 mg po bid X 7 days**
  - If bloody discharge, perianal ulcers, or mucosal ulcers in MSM with positive rectal chlamydia NAAT or HIV+ treat with **doxycycline X 3 weeks**
  - Rx all contacts/Partners exposed within 60 days before onset of symptoms in patient
  - +GC or +CT: retest in 3 months
  - May treat for HSV for presence of pain

- PrEP

WHAT's NEW? - Technology

- Testing
  - Patients order testing on-line
    - Lab
    - At home
  - SMARTPHONE
    - STD diagnosis with single drop of blood via Smartphone
    - Dongle connects to smartphone
    - Triplexed immunoassay for HIV ab,

      treponemal-specific antibody and non-treponemal antibody

WHAT's NEW? - Technology

- Results
  - Cell Phones/Email
- Notifying contacts –
- https://dontspreadit.com/
- http://www.inspot.org/
- http://www.stdcheck.com/anonymous-notification.php
- http://www.bettertoknow.org.au/index

HOW DOES IT WORK?

- Put in first name, email address, cell phone number
- Can enter multiple contacts
- Click on the STI
- Send message (SMS- short message service) - anonymous

How Can Practitioners Make a Difference?

- Education
  - Prevention
    - Condoms
    - **PrEP**
  - Transmission
  - Asymptomatic infection
- Screening
- Screening
- Screening
- Contact tracing and treatment
- Vaccine development

ADDITIONAL SLIDES

Screening Women: Gonorrhea & Chlamydia

- Annual Screening
  - Sexually active women <25 years at urogenital, rectal and pharyngeal (GC)
    - Based on reported sexual behaviors & exposure at these sites
  - Sexually active women > 25 years if at increased risk

    (new contact, >1 sexual contact, sex partner with concurrent partners, or sex partners with STI, inconsistent condom use, sex for money/drugs, other STI)
- Retest 3 months after treatment

Screening Men: Gonorrhea & Chlamydia

- Consider screening in young men in high prevalence clinical settings or in populations with high burden of infection
  - (e.g. MSM, correctional facilities, STI clinics)

Special Populations - Adolescents

- Minors can consent for STI care in all 50 states and the District of Columbia
- Age at which a minor can consent varies among states
- HIV screening – should be discussed and offered to all adolescents
- Syphilis screening – YMSM, pregnant females

- GC/CT –
  - Screening annually for all sexually active females <25 years
  - Men correctional facilities STD clinics , YMSM
  - Consider OPT –OUT Screening

- HPV vaccine
  - 9 Valent vaccine

- Cervical cancer screening – age 25

- HAV/HBV vaccine series
  - Offer to adolescents and young adults who have not been previously vaccinated

Special Populations – WSW/ WSWM

- 26% of WSW reporting never having a male partner were
  + Ab to HPV-16

  42% + Ab for HPV 6

  - "WSW are at risk for acquiring HPV from both their female and from current or prior male partners"
    – screen for cervical ca
- "Sexual transmission of HSV-1 and HSV-2 can occur between female partners - counseling
- Transmission of syphilis (oral sex) has been reported
- 53-99% of WSW have had sex with men

Transgender Men & Women

- Definition – “Identify with a sex that differs from that they were assigned at birth”
- Transgender women
  - Among **all transgender women 14% are HIV +**
  - Among **black trans-women 44% are HIV +**
- STD/HIV risk based on current anatomy and sexual behaviors
  - Trans-man: may still have vagina/cervix

Special Populations – Pregnant Women

- **HIV** screen - **first prenatal** visit, and 3rd trimester if at high risk
- HBsAg – first prenatal visit
- Chlamydia/GC: All *<25 yrs* and >25 yrs at increased risk
  - (new contact, more than one partner, sex partner with concurrent partner, sex partner with STI)
- HCV: All pregnant women
  - (Highest risk –Injection drug use; blood transfusion before 1992; *unregulated tatoo, long-term hemodialysis, intranasal drug use and other percutaneous exposures*
- HSV – type specific serologic tests might be useful for identifying pregnant women at risk for HSV infection and guiding counseling

  (Routine screening not recommended)
- **Syphilis** –all pregnant women at first prenatal visit;

  women at high risk or lives in area of high syphilis rate should be **rescreened early in 3rd trimester, and again at time of delivery**

Screening

- **HIV**
  - **Patients at high risk for HIV infection with early syphilis, gonorrhea or chlamydia should be tested for HIV infection *even if recently tested***
- Syphilis
- Hepatitis C

Trichomonas – Diagnosis

- Wet mount: Sensitivity 51-65%
- NAAT:
  - APTIMA T. vaginalis (Hologic Gen-Probe),
  - Probe Tec TV Qx Amplified DNA assay (Becton-Dickinson)
    - FDA cleared: vaginal, endocervical, urine from women
    - Sensitivity 95-100%; Specificity 95-100%
- Max CTGCTV2 (BD) – Can be used in men and women
- Gene XPERT (Cepheid)
  - FDA cleared: endocervical, vaginal or urine
  - Can also be used in men – urine/urethral swabs if assay is validated
- Affirm VPIII (BectonDickinson)-DNA hybridization probe test
  - (T. vaginalis , G. Vaginalis, C. Albicans) Sensitivity T. vag 63%; Specificity 99%
- Antigen tests
- OSOM Trichomonas Rapid Test (Sekisui Diagnostics)
  - POCT -10 min; sens. 82-95%, spec 97-100%.
- Amplivue (Quidel)
- Solana (Quidel)
- Culture
- In Pouch Sensitivity 75-96%; specificity 100%

Trichomonas

- Metronidazole resistance 4-10% of cases
- Tinidazole resistance 1%
- High rate of reinfection 17% within 3 months
  - - retest in 3 months

Trichomonas - Rx

- Metronidazole 500 mg po bid X 1 week

  Tinidazole 2 g po once

- Alternative
  - Metronidazole 2 gram once (Men)
- Pregnancy
  - Metronidazole 2 g po once

HPV

- 83-95% of cases of anal cancer
- 20-50% of vulvar cancer
- 60-65% of vaginal cancer
- 30-42% of penile cancer

Parkin DM;Vaccine 2006

- Oral cancers

Human Papillomavirus Vaccine

- **9 Valent (GARDASIL 9, Merck & co)**
  HPV 6, 11, 16, 18, 31, 33, 45, 52, 58

- Woman and Men age 9-45 years of age

HPV Can Be Transmitted Non-sexually

- Common disinfectants (alcohol, glutaralde) not effective
- Bleach/Autoclaving

J Meyers; J Antimicrob Chemo; 2014

New Strategies – Before, During and After Covid

- STD Express visits – can increase testing
  - Walk-in for screening, testing and treatment without appt.
  - Or Full examination
  - The more we can test, the more we can treat and stop transmission

- Pharmacy and Retail Health Clinics
  - On site testing & treatment
  - Flexibility and convenience

New Strategies – Before, During and After Covid

- Telemedicine
  - Insures access
  - Enables care despite closure of clinics.
  - Those with symptoms can be referred to clinic
  - Those without symptoms could be mailed testing kits or go to local labs
  - Can be helpful in rural areas
  - Self-collection – outside the clinical setting

Follow-up for patient's not evaluated in person

- Advise patient that if their symptoms do not improve or resolve within 5-7 days, they should followup with the clinic or a medical provider to be seen.
- Patients should be counseled to be tested for STIs once clinical care is available
- Testing and screening should be performed once services are available.
- All patients receiving regimens other than Benzathine penicillin G for syphilis treatment should have repeat serologic testing performed 3 months post-treatment