Sexually Transmitted Infections

Management Updates & Pearls

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Disclosures

- None

Objectives

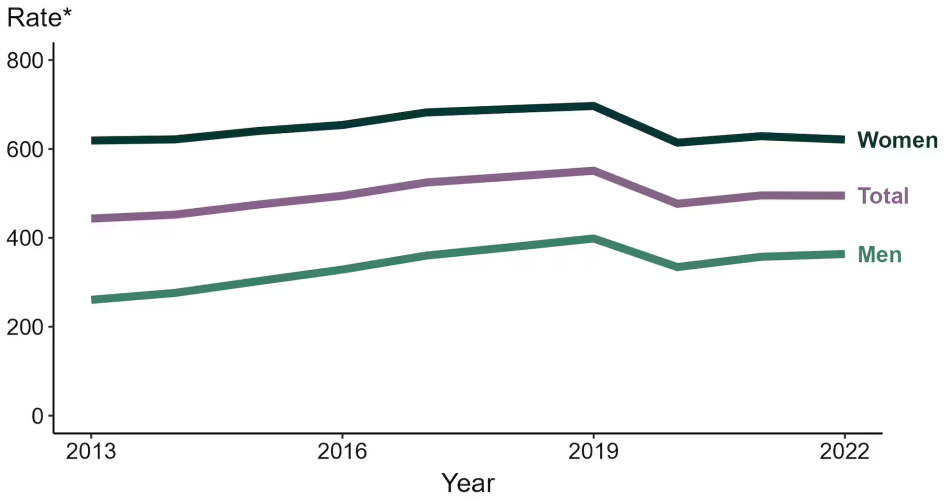
- Recall long-term sequelae of the common sexually transmitted infections (STIs)
- Recognize two appropriate methods of diagnosis of each STI reviewed
- Distinguish between the treatment options for nonpregnant and pregnant women
- Identify the accuracy of diagnostic methods as it pertains to the common STIs discussed

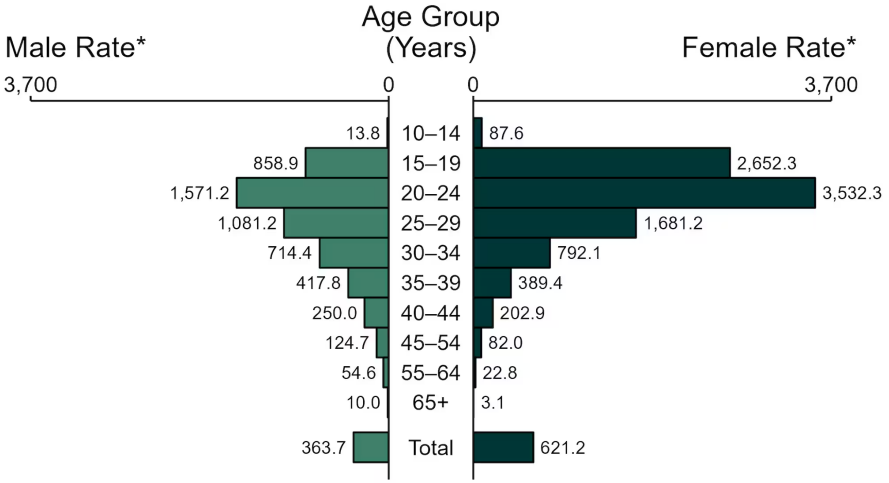
STIs

- On the rise
- Because STIs can often be asymptomatic and require timely screening, diagnosis of infections is affected by access to sexual health care (ie: COVID, closure of hospitals/clinics, etc)

Chlamydia

- Most common nationally notifiable STI in 2022





www.cdc.gov

- Long-term risks:
  - Pelvic inflammatory disease (PID)
  - Infertility
  - Ectopic pregnancy
  - Chronic pelvic pain
  - Increased risk of HIV

Screening & Treatment

- Recommendations:
  - Annually for sexually active females <25yo
  - >25yo at increased risk (new partner, multiple partners, partner with hx of STI)
  - Transgender/gender diverse: screen based on anatomy
- Rescreen 3 months after treatment d/t high re-infection rates

- Preferred: **Doxycycline 100mg PO BID x7d**
- Alternative: Azithromycin 1gm PO x1 OR Levofloxacin 500mg PO 1x/day x7d
- Pregnancy: Azithromycin 1gm PO x1 OR Amoxicillin 500mg PO TID x7d

Gonorrhea

- Second most common nationally notifiable STI
- Rates higher among men - 137% rate increase among MSM (men who have sex with men)
- Long-term risks:
  - PID
  - Infertility/ectopic pregnancy
  - Chronic pelvic pain
  - Increased risk of HIV

Screening & Treatment

- Screening:
  - yearly for sexually active females <25yo
  - “At risk” females >25yo
  - Transgender/gender diverse: screen based on anatomy
- Rescreen 3 months after treatment d/t high re-infection rates
- **test for chlamydia at the same time d/t rate of coinfection**

- Preferred: Ceftriaxone 500mg IM x1(<150kg); 1gm if >150kg
- Alternative:
  - Cephalosporin allergy: Gentamicin 240mg IM x1 + Azithromycin 2gm PO x1
  - Ceftriaxone not available: Cefixime 800mg PO x1
- Pregnancy: Ceftriaxone 500mg IM x1
- Treat for Chlamydia if not ruled out

Antibiotic Resistant Gonorrhea

- About 50% of all gonorrheal infections were estimated to be resistant to 1+ antibiotics
- Almost all strains are susceptible to ceftriaxone

Syphilis

- Historic low in 2000-2001 but rates have continued to increase yearly
- 2022: highest number of cases since 1950 (207,255)
- 17.3% increase in rates for men and women since 2021
- 185% increase in rate of congenital syphilis between 2014-2018

- Long-term risks
  - Progression of primary/secondary disease to late stage 15% of the time if untreated
  - Increased risk of HIV
  - Morbidity of the following:
    - Ocular
    - Neuro
    - Cardiovascular
    - Bone
    - Skin

Screening & Treatment

- Recommendations:
  - All pregnant woman at 1st prenatal visit
  - If high risk for infection during pregnancy, repeat at 28 weeks of gestation and delivery
  - Transgender: annual screening

- Primary/Secondary/early latent: Penicillin (PCN) benzathine G 2.4mill units IM x1
- Latent: PCN benzathine G 2.4mill units IM x1 weekly for 3 doses (total 7.2mill units)
- Neurosyphilis: Aqueous crystalline PCN G 3-4mill units IV q4h or continuous x10-14d (18-24mill units/day total)
- Pregnancy: same for primary/secondary/latent

Trichomoniasis

- Most prevalent nonviral STI globally
- Challenging to track since not a reportable disease and no recommendations for general screening
- Difficult to diagnose since 70-85% of people have minimal/no symptom
- Other symptoms:
  - Malodorous, yellow-green vaginal discharge
  - “Strawberry” cervix (usually seen on colposcopy)

Screening & Treatment

- Recommendations:
  - Women presenting with complaints of vaginal discharge
  - Consider annual screening in “high prevalence” settings (STI clinics, correctional facilities)
  - Consider annual screening for women at high risk for infection:
    - Multiple sex partners
    - Transactional sex
    - Drug use
    - Hx of STIs
    - Hx of incarceration

- Preferred: metronidazole 500mg PO bid x7d
- Alternative: tinidazole 2gm PO x1

Human Papillomavirus (HPV)

- Most common STI in the US overall
- ~92% of cancers associated with can be prevented with vaccination
- Prevalence of cancer-associated HPV decreased 86% (females 14-19yo) and 71% (females 20-24yo) in the decade following HPV vaccination introduction.
- Vaccination rates lowest in the Southern US

- Long-term risks:
  - Cervical Cancer
  - Anal cancer
  - Vulvar cancer
  - Vaginal Cancer
  - Genital warts
  - Oropharyngeal cancer

HPV Vaccine

- Since 2016, vaccine in US prevents infections of 9 HPV types:
  - 2 causing genital warts
  - 7 causing cancers
- Vaccine MOST effective prior to sexual debut
- Biggest challenge is addressing “missed opportunities”
  - Studies show single best predictor of vaccination of any type is strong recommendation from provider
  - Adherence of HPV vaccine recommendations is lower than that of pediatric immunizations

Screening Principles

Screening Methods: Is one superior?

- Methods for screening/detection:
  - Vaginal swabs (provider or self-administered)
  - Urine
  - Detected on pap smear
  - Serologic testing (Syphilis, HIV, Hepatitis)
- NAAT (nucleic acid amplification test)/Culture > Urine > Pap finding
  - NAAT has>90% accuracy
  - NAAT = preferred test for trich
  - Culture being replaced by NAAT in some settings

NAAT (Nucleic Acid Amplification Test)

- Optimal method for diagnosis of gonorrhea and chlamydia
- Amplifies DNA/RNA sequences using methods like PCR.
- Can theoretically detect as little as one organism in a sample
- Pros: rapid results, increased sensitivity, ability to use method on self-collected samples
  - Cultures take longer and require a pelvic exam in females
- Cons: unable to detect antimicrobial sensitivities, $$$

- Can be performed:
  - Endocervical
  - Vaginal
  - Urine (male and females)
  - Urethral (males only)
- Preferred specimens: vaginal swab for females
- Vaginal swab NAAT = cervical
  - Allows for self collection by patient
- NAAT urine has lower sensitivity in females vs vaginal

Culture

- Pros: determine antibiotic susceptibilities
- Cons: delay in results (can take ~48h), reduced sensitivity in asymptomatic patients
- Perform a culture if treatment failure noted

Urine testing

- 2014 United States Preventive Services Taskforce (USPSTF) review showed 72-98% sensitivity for chlamydia with urine testing vs 86-100% with endocervical/vaginal testing
- Chlamydia: more variability in sensitivity with urine testing vs across 5 different anatomic locations
- Gonorrhea: urine samples were less sensitive vs vaginal samples (and to a lesser degree, endocervical)
  - This could be due to swabbing of vaginal discharge being most accurate way to detect

Conventional Pap smear

- **Should not** be used for trichomoniasis diagnosis due to false-positive rate (7%)
- Sensitivity for trich is 51-63%
- Asymptomatic patients with trichomonads noted on pap should have NAAT/culture performed
- Acceptable for NAAT testing for gonorrhea

- NAAT of vaginal swabs are the preferred specimens for screening/diagnosis
- NAAT from pap acceptable EXCEPT for trich
- Consider first void urine when vaginal swabs are not possible due to test shortages, need for non-invasive testing

Expedited Partner Therapy

- EPT = treating sex partners of a person with an STI without medical evaluation
- EPT is a cost-saving and cost-effective management strategy
- Currently permissible in 47 states (including TN, KY, WV)
- Legal guidance: https://www.cdc.gov/sti/php/ept-legal-status/index.html

EPT - Patient Selection and Considerations

- Chlamydia: patient's sex partners in last 60 days. If no sex in last 60 days, then offer treatment for last partner. Doxy preferred
- Gonorrhea: prefer evaluation d/t ceftriaxone being IM
  - If concern for no followup, treat with cefixime 800MG PO x1 (+/- chlamydia treatment)
- Legality of EPT for trichomoniasis is state-dependent

DEPARTMENT OF HEALTH

Recommended EPT Regimen Quick Reference

Statutory authority expressly AUTHORIZES EPT in the State of Minnesota under Minnesota Statutes, Section 151.37 Subd. 2(g).

All sexual partners **within the last 60 days** may be offered EPT

If no sexual partners in last 60 days:
The **single most recent** sexual partner may be offered EPT

Infection	Preferred Regimen		Alternative Regimens	Safe in Pregnancy*
Chlamydia	Doxycycline 100 mg orally twice daily for 7 days		Azithromycin 1 gram orally for one dose	Azithromycin 1 gram orally for one dose†
Gonorrhea	Cefixime 800 mg orally for one dose		Cefpodoxime 400 mg orally for one dose	Either the preferred or alternative regimen
Trichomoniasis	Female	Metronidazole 500 mg orally twice daily for 7 days	Tinidazole 2 grams orally for one dose‡	Metronidazole 500 mg orally twice daily for 7 days
	Male	Metronidazole 2 grams orally for one dose		

***ALL pregnant partners of index cases should be linked to prenatal care in addition to receiving the recommended antimicrobial treatment regimen(s) listed above**

†For pregnant persons who have contraindications for azithromycin being used for chlamydia EPT, amoxicillin 500 mg orally three times daily for 7 days is an acceptable alternative for EPT

‡For females in whom a 7 day course of metronidazole is not feasible for Trichomoniasis, 2 grams of metronidazole orally for one dose is an acceptable alternative for EPT

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Summary

[Uptodate STI Screening]

Sexually transmitted infection screening recommendations by sex and population

Sex	Population	Routine screening recommendation	Screening frequency	Additional screening recommendations and comments
Females	Age <25 years	Genital chlamydia*	Annually	If at increased risk¶, additionally screen for: ▪ Syphilis ▪ Trichomoniasis
		Genital gonorrhea*	Annually	
		HIV	At least once	
		HBV	At least once (if age ≥18 years and immunity not already documented)Δ	
		HCV	At least once (if age ≥18 years)◇	
	Age ≥25 years	HIV	At least once	If at increased risk¶, additionally screen for: ▪ Genital chlamydia and gonorrhea* ▪ Syphilis ▪ Trichomoniasis
		HBV	At least once (if immunity not already documented)Δ	
		HCV	At least once◇	
	Pregnant	Genital chlamydia*	First trimester (if <25 years or at increased risk¶)	Repeat screening for these infections in third trimester if at increased risk. Additional screening at first prenatal visit: ▪ HCV for those at risk (or if ≥18 years with no prior screening)◇ ▪ Trichomoniasis for those with HIV
		Genital gonorrhea*	First trimester (if <25 years or at increased risk¶)	
		Syphilis	First trimester	
		HIV	First trimester	
		HBV	First trimester	
	With HIV infection	Genital chlamydia*	Annually	
		Genital gonorrhea*	Annually	
		Genital trichomoniasis	Annually	
		Syphilis	Annually	
		HBV	First visit	
		HCV	First visit	
	WSW and WSWM	WSW and WSWM should not be assumed to be at lower risk for STIs on the basis of their sexual orientation. Screening for cervical cancer and STIs should be conducted according to guidelines for women, based on an open discussion of sexual and behavioral risk factors.		
Males	MSW only without HIV infection	HIV	At least once	If at increased risk§, additionally screen for: ▪ Genital chlamydia and gonorrhea ▪ Syphilis Targeted screening venues for chlamydia include adolescent clinics, STI clinics, and correctional facilities.
		HBV	At least once (if age ≥18 years and immunity not already documented)Δ	
		HCV	At least once (if age ≥18 years)◇	
	MSM without HIV infection	Genital chlamydia	At least annually	More frequent screening (every three months) for chlamydia, gonorrhea, and syphilis is recommended in those with risk factors. More frequent screening for HIV, HBV, and HCV may also be warranted.¥
		Rectal chlamydia (if exposed)	At least annually	
		Genital gonorrhea	At least annually	
		Rectal gonorrhea (if exposed)	At least annually	
		Pharyngeal gonorrhea (if exposed)	At least annually	
		Syphilis	At least annually	
		HIV	At least annually	
		HAV	At least once	
		HBV	At least once	
		HCV	At least once	
	MSW only with HIV infection	Genital chlamydia	Annually	
		Genital gonorrhea	Annually	
		Syphilis	Annually	
		HBV	At least once (first visit)	
		HCV	At least once (first visit)	
	MSM with HIV infection	Genital chlamydia	At least annually	More frequent screening (every three months) for chlamydia, gonorrhea, and syphilis is recommended in those with risk factors. More frequent screening for HBV and HCV may also be warranted.¥
		Rectal chlamydia (if exposed)	At least annually	
		Genital gonorrhea	At least annually	
		Rectal gonorrhea (if exposed)	At least annually	
		Pharyngeal gonorrhea (if exposed)	At least annually	
		Syphilis	At least annually	
		HAV	At least once (first visit)	
		HBV	At least once (first visit)	
		HCV	At least annually	
Transgender and gender-diverse individuals		Screening for STIs should be based on an individual's anatomy and sexual practices. Recommendations for genital gonorrhea, chlamydia and cervical cancer screening in cisgender women should be extended to all transgender men and gender-diverse individuals with a cervix. Screening for other STIs should be based on risk factors and exposures.		

HBV: hepatitis B virus; HCV: hepatitis C virus; MSM: men who have sex with men; MSW: men who have sex only with women; HAV: hepatitis A virus; STI: sexually transmitted infection; WSW: women who have sex with women; WSWM: women who have sex with women and men.

* Screening for nongenital infections in females (eg, rectal chlamydial infection, pharyngeal and rectal gonococcal infection) can be considered based on reported sexual behaviors and exposure, via shared clinical decision-making between the patient and the provider.

¶ Factors conferring increased risk for gonorrhea, chlamydia, and trichomoniasis in females include transactional sex, new sex partner, multiple sex partners, a sex partner with concurrent partners, or a sex partner with an STI. Risk factors for syphilis include residence in high-prevalence areas, history of incarceration, or transactional sex work. STI screening may also be considered in high-prevalence settings (eg, STI clinic or correctional facility).

Δ For all adults 18 years of age or older, regardless of risk factors, at least one-time screening for HBV infection is recommended, unless they have documented vaccine receipt and serologic evidence of vaccine response. Those who are susceptible should be vaccinated. For those who have risk factors for HBV exposure, ongoing screening is warranted if they are unvaccinated or have nonresponse to vaccination. Refer to other UpToDate content on STIs for details.

◇ All adults 18 years of age or older should be screened for HCV at least once, except in settings where the HCV positivity is <0.1%.

§ Factors conferring increased risk for gonorrhea and chlamydia in MSW include an infection in the preceding 24 months. Screening for chlamydia in young males can be considered in high-prevalence clinical settings (adolescent clinics, correctional facilities, STI/sexual health clinic). Increased risk factors for syphilis may be based on geography, race/ethnicity, history of incarceration, transactional sex work, or age <29 years.

¥ Increased risk factors for gonorrhea, chlamydia, syphilis, and HIV among MSM include multiple or anonymous partners; intravenous drug use; sex in conjunction with illicit drug use, including methamphetamines; and sex partners who engage in these activities. MSM who have not been vaccinated for HBV or have had nonresponse to vaccination remain at risk for HBV infection. Increased risk factors for hepatitis C infection among MSM include HIV infection, high community HCV prevalence and incidence, high-risk sexual behaviors, and concomitant ulcerative STIs or STI-related proctitis.

Adapted from: California Sexually Transmitted Infections (STI) Screening Recommendations, 2021. California Department of Public Health, Sexually Transmitted Diseases Control Branch. Available at: https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/California-STI-Screening-Recommendations.aspx (Accessed on January 24, 2023).

Additional information from:

1. Workowski KA, Bachmann LH, Chan PA, et al. Sexually Transmitted Infections Treatment Guidelines, 2021. MMWR Recomm Rep 2021; 70:1.
2. Conners EE, Panagiotakopoulos L, Hofmeister MG, et al. Screening and testing for hepatitis B virus infection: CDC recommendations – United States, 2023. MMWR Recomm Rep 2023; 72:1

- NAAT or other culture testing of vagina or cervix preferred for diagnosis
- High false positive rate for trichomoniasis on pap - confirm with vaginal/cervical NAAT
- Reserve urine STI testing for patients where vaginal swab is not possible (hx of trauma, etc)
- Consider EPT for gonorrhea/chlamydia to prevent re-infection, transmission to others

Questions?

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References

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