

Treatment of Sexually Transmitted Infections (STIs) in Adolescents
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Sexually transmitted infections (STIs) refers to an array of clinical syndromes and infections caused by pathogens which are acquired and transmitted through sexual activity. The four curable STIs are currently: syphilis, gonorrhea, chlamydia, and trichomoniasis. Incurable viral STIs include hepatitis B, herpes simplex virus (HSV), human immunodeficiency virus (HIV), and human papillomavirus (HPV). Health-care providers play an integral role in the prevention and treatment of STIs. The state of Alabama ranks 9th in chlamydial and gonorrheal infections and 19th in primary and secondary syphilis (the stages in which syphilis is most infectious).

5 Strategies for Prevention and Control of STIs

1. Risk assessment, education, and counseling on strategies to avoid STIs through changes in sexual behavior and use of prevention services
2. Pre-exposure vaccination of persons at risk for vaccine-preventable STIs
3. Identification of asymptotically infected persons and persons with STI symptoms
4. Effective diagnosis, treatment, counseling, and follow-up
5. Evaluation, treatment, and counseling of sex partners of persons who are infected with an STI

Screening for STIs - Special Considerations for Adolescents and Young Adults Under 25 Years of Age

- **HIV:** All adolescents and adults from ages 13-64 should be tested at least once for HIV. Anyone who has unsafe sex or shares injection drug equipment should get tested for HIV at least annually.
- **Sexually active women younger than 25:** Test annually for gonorrhea and chlamydia
- **All pregnant women:** Test for syphilis, HIV, and hepatitis B starting early in pregnancy. At-risk pregnant women should also be tested for chlamydia and gonorrhea – repeat testing as needed
- **All sexually active gay and bisexual men:** Test at least annually for syphilis, chlamydia, and gonorrhea –

A Guide to Taking a Sexual History – The Five P's

- **Partners:**
 - Are you currently sexually active?
 - In recent months/past 12 months, how many sex partners have you had?
 - Are your sex partners men, women, or both?
- **Practices:**
 - What kind of sexual contact do you have or have you had (genital, anal, oral)?
- **Protection from STDs:**
 - Do you and your partner(s) use any protection against STIs? If not, could you tell me the reason?
 - If so, what kind of protection do you use? How often do you use this protection
- **Past history of STDs:**
 - Have you ever been diagnosed with an STI? When? How were you treated?
 - Have you ever been tested for HIV, or other STIs? Would you like to be tested?
 - Has your current partner/former partners ever been diagnosed/treated for an STI? Were you tested as well?
- **Prevention of pregnancy:**
 - Are you concerned about getting pregnant or getting your partner pregnant?
 - Are you using contraception or practicing any form of birth control?

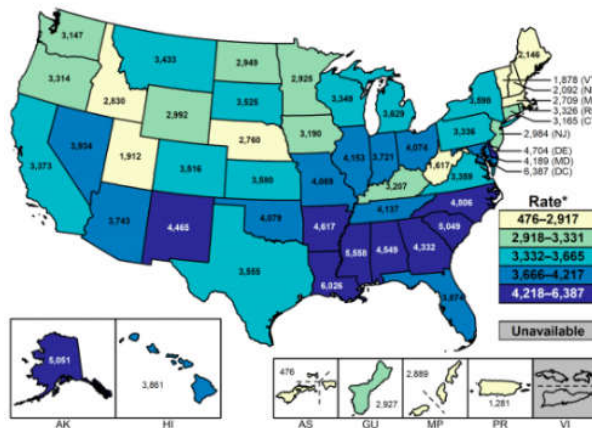
Treatment of Adolescent STIs

Chlamydia

Signs of infection	
Men	Women
Discharge from the penis Testicular pain	Vaginal discharge Painful sexual intercourse Bleeding between periods and after sex

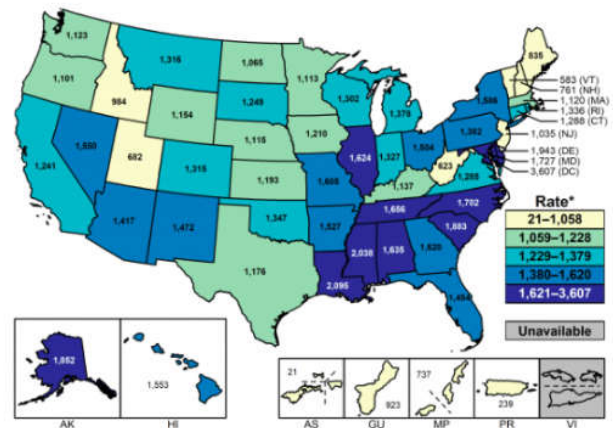
Recommended Antibiotic	Dose	CDC Alternatives
Azithromycin	1 gram (single dose)	Erythromycin base 500 mg 4x/day for 7 days Erythromycin ethylsuccinate 800 mg 4x/day for 7 days Levofloxacin 500 mg 1x/day for 7 days Ofloxacin 300 mg 2x/day for 7 days
OR		
Doxycycline	100 mg orally 2x/day for 7 days	

Figure K. Chlamydia — Rates of Reported Cases Among Females Aged 15–24 Years by State and Territory, United States, 2018



NOTE: See Sections A1.2 and A1.11 in the Appendix for more information on interpreting and estimating reported rates in US territories.

Figure L. Chlamydia — Rates of Reported Cases Among Males Aged 15–24 Years by State and Territory, United States, 2018



NOTE: See Sections A1.2 and A1.11 in the Appendix for more information on interpreting and estimating reported rates in US territories.

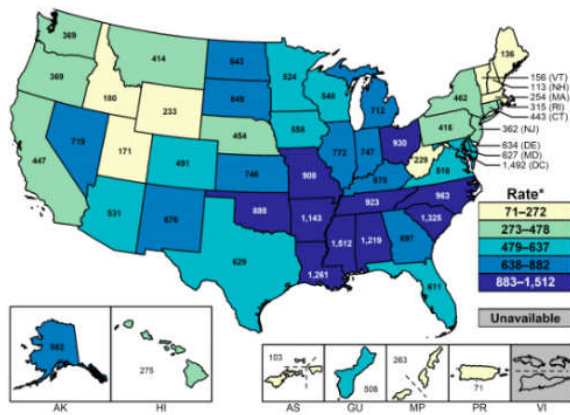
Gonorrhea – uncomplicated infections of cervix, urethra, and rectum

Signs of infection	
Men	Women
Painful urination Pus-like discharge from the tip of the penis Pain or swelling in one testicle	Increased vaginal discharge Painful urination Bleeding between periods and after sex

Note: Gonorrhea can also affect the rectum, eyes, throat, and joints

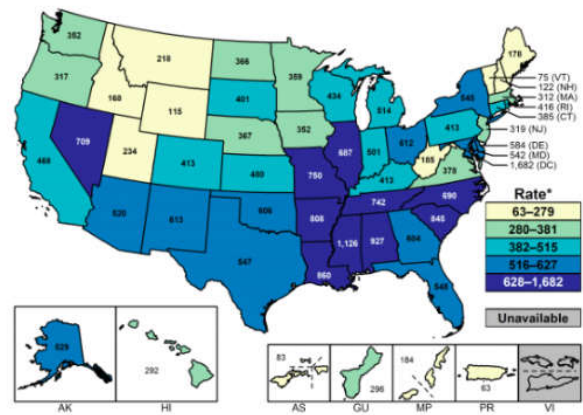
Recommended Antibiotic	Dose	CDC Alternatives
Ceftriaxone	250 mg IM (single dose)	Ceftriaxone Not Available Cefixime 400 mg orally (single dose) PLUS Azithromycin 1 gram (single dose) Cephalosporin Allergy Gemifloxacin 320 mg orally (single dose) PLUS Azithromycin 2 grams orally (single dose) OR Gentamicin 240 mg IM (single dose) PLUS Azithromycin 2 grams orally (single dose)
PLUS		
Azithromycin	1 gram orally (single dose)	

Figure M. Gonorrhea — Rates of Reported Cases Among Females Aged 15–24 Years by State and Territory, United States, 2018



* Per 100,000.
 NOTE: See Sections A1.2 and A1.11 in the Appendix for more information on interpreting and estimating reported rates in US territories.

Figure N. Gonorrhea — Rates of Reported Cases Among Males Aged 15–24 Years by State and Territory, United States, 2018



* Per 100,000.
 NOTE: See Sections A1.2 and A1.11 in the Appendix for more information on interpreting and estimating reported rates in US territories.

Syphilis

Signs of infection	
Primary	Chancre located where the bacteria enters the body – may be hidden within the vagina or rectum
Secondary	Rash on the trunk that eventually will cover the entire body – accompanied by wart-like sores in the mouth/genital area

Primary, secondary, or early latent < 1 year

Recommended Antibiotic	Dose	CDC Alternatives
Benzathine penicillin G	2.4 million units IM (single dose)	Doxycycline 100 mg 2x/day for 14 days OR Tetracycline 500 mg 4x/day for 14 days

Latent > 1 year, latent of unknown duration

Recommended Antibiotic	Dose	CDC Alternatives
Benzathine penicillin G	2.4 million units IM in 3 doses each at 1 week intervals (7.2 million units total)	Doxycycline 100 mg 2x/day for 28 days OR Tetracycline 500 mg 4x/day for 28 days

Bacterial vaginosis

Signs of infection
Thin, gray, white or green vaginal discharge Foul-smelling “fishy” vaginal odor Vaginal itching Burning during urination

Recommended Antibiotic	Dose	CDC Alternatives
Metronidazole	500 mg orally 2x/day for 7 days	Tinidazole 2 grams orally 1x/day for 2 days OR Tinidazole 1 gram orally 1x/day for 5 days OR Clindamycin 300 mg orally 2x/day for 7 days OR Clindamycin ovules 100 mg intravaginally at bedtime for 3 days
OR		
Metronidazole (gel) 0.75%	One 5 gram applicator intravaginally 1x/day for 5 days	
OR		
Clindamycin (cream) 2%	One 5 gram applicator intravaginally at bedtime for 7 days	

Trichomonas vaginalis

Signs of infection
Foul-smelling vaginal discharge – white, gray, yellow, or green Genital redness, burning, and itching Pain with urination or sexual intercourse

Recommended Antibiotic	Dose	CDC Alternatives
Metronidazole	2 grams orally (single dose)	Metronidazole 500 mg 2x/day for 7 days
OR		
Tinidazole	2 grams orally (single dose)	

Genital herpes simplex

Signs of infection
Pain/itching in the genital area Small red bumps or white blisters that lead to ulcers and scabs Sores in the genital areas

Type	Recommended Rx	Dose	Treatment Duration
1 st clinical episode	Acyclovir	400 mg orally 3x/day OR	7-10 days
		200 mg orally 5x/day OR	
	Valacyclovir	1 gram orally 2x/day OR	
	Famciclovir	250 mg orally 3x/day	

Episodic therapy for recurrent herpes	Acyclovir	400 mg orally 3x/day for 5 days	OR
		800 mg orally 2x/day for 5 days	OR
		800 mg orally 3x/day for 2 days	OR
	Valacyclovir	500 mg orally 2x/day for 3 days	
		1 gram orally 1x/day for 5 days	
	Famciclovir	125 mg orally 2x/day for 5 days	
		1 gram orally 2x/day for 1 day	
		500 mg orally once, followed by 250 mg 2x/day for 2 days	

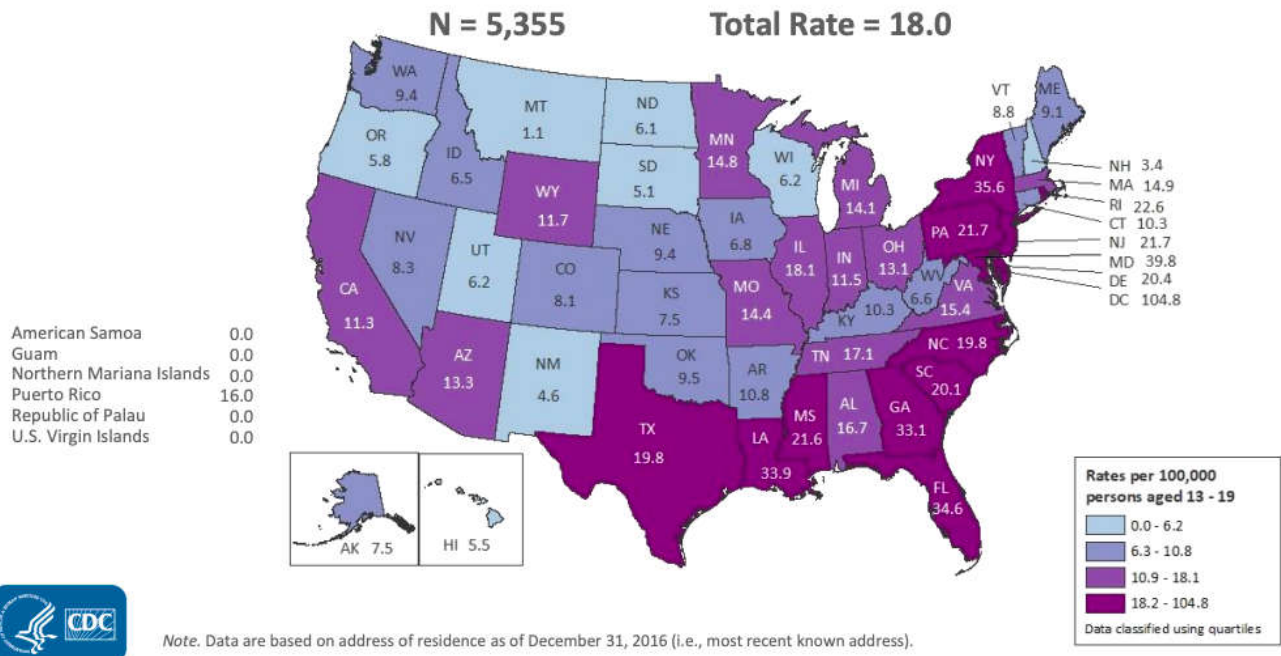
Pelvic inflammatory disease (PID)

Signs of infection
Pain in lower abdomen/pelvis
Heavy vaginal discharge with unpleasant odor
Bleeding between periods and after sex
Pain during intercourse
Fever (sometimes with chills)
Painful/difficult urination

Recommended Antibiotic	Dose	CDC Alternatives
Parenteral Regimens		
Cefotetan PLUS	2 grams IV every 12 hours	Ampicillin/Sulbactam 3 grams IV every 6 hours PLUS Doxycycline 100 mg orally or IV every 12 hours
Doxycycline	100 mg orally or IV every 12 hours	
OR		
Cefoxitin PLUS	2 grams IV every 6 hours	
Doxycycline	100 mg orally or IV every 12 hours	
Intramuscular/Oral Regimens		
Ceftriaxone PLUS	250 mg IM (single dose)	
Doxycycline WITH OR WITHOUT	100 mg orally twice a day for 14 days	
Metronidazole	500 mg orally twice a day for 14 days	
OR		
Cefoxitin PLUS	2 grams IM (single dose)	
Probenecid PLUS	1 gram orally administered concurrently (single dose)	
Doxycycline WITH OR WITHOUT	100 mg orally twice a day for 14 days	
Metronidazole	500 mg orally twice a day for 14 days	

HIV and Youth

Rates of Adolescents Aged 13–19 Years Living with Diagnosed HIV Infection Year-end 2016—United States and 6 Dependent Areas



Preexposure prophylaxis (PrEP)

- HIV screening should be discussed with adolescents who are sexually active or have a history of injection drug use.
- None of the PrEP trials have included persons under the age of 18 – clinicians should carefully consider the lack of safety data and effectiveness of PrEP in persons under 18 years of age

Recommended Antiviral	Components (per tablet)	Dose
Descovy	Emtricitabine 200 mg	Adolescents weighing ≥ 35 kg: 1 tablet once daily
	Tenofovir alafenamide 25 mg	
Truvada	Emtricitabine 200 mg	
	Tenofovir Disoproxil 300 mg	

References

A Guide to Taking a Sexual History . (n.d.). Retrieved February 1, 2020, from <https://www.cdc.gov/std/treatment/sexualhistory.pdf>

Bala, Manju., Bolan, Gail., Dillon, Jo-Anne R., Eremin, Sergey R., Lahra, Monica M., Ndowa, Francis., Ramon-Pardo, Pilar., Unemo, Magnus., Wi, Teodora. (2017). Antimicrobial resistance in *Neisseria gonorrhoeae*: Global surveillance and a call for international collaborative action. *PLoS Med.* 14(7): e1002344. Available: <https://doi.org/10.1371/journal.pmed.1002344>

Bolan, Gail A., Workowski, Kimberly, A. (2015). Sexually Transmitted Diseases Treatment Guidelines, 2015. *MMWR Recommendations and Reports.* 64(3): 1-140. Available: <https://www.cdc.gov/std/tg2015/tg-2015-print.pdf>

STDs in Adolescents and Young Adults - 2018 Sexually Transmitted Diseases Surveillance. (2019, July 30). Retrieved February 5, 2020, from <https://www.cdc.gov/std/stats18/adolescents.htm>

Which STD Tests Should I Get? (2014, June 30). Retrieved February 1, 2020, from <https://www.cdc.gov/std/prevention/screeningreccs.htm>