Update on Vaginal Infections and HPV Vaccine

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1

Disclosure Statement

- I have no conflicts of interest to disclose.

2

Objectives

- Discuss the diagnosis and treatment of common non-sexually transmitted vaginal infections.
- Explore the diagnosis and treatment of sexually transmitted infections frequently diagnosed in primary care.
- Review the updated guidelines for the human papillomavirus (HPV) vaccine.

3

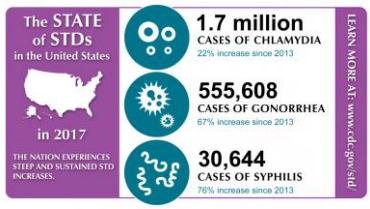
What Is Vaginitis?

- Vaginal symptoms are a common complaint in primary care settings.
- Vaginitis includes vaginal disorders caused by:
  - Infection
  - Inflammation, or
  - Changes in the vaginal flora.
- Evaluation should include:
  - History
  - Physical Examination
  - Microscopy
  - Testing for sexually transmitted infections.
- Treatment is determined by the diagnosis.

(Sobel, 2018)

4

CDC: "Steep and Sustained STD Increases"



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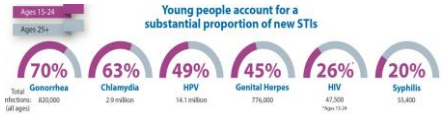
Young Adults and STDs



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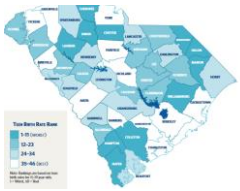
What about Teen Birth Rates?

- The teen birth rate in SC has decreased 70% since the 1990s.
  - There was a 9% decline from 2016 to 2017.
  - See map of SC 2017 Teen Birth Rate.
- Are teens using contraceptive methods but not condoms?



(SC Campaign to Prevent Teen Pregnancy, 2018)

7

Prevention of STDs

8

CDC STD Testing Guidelines for Women

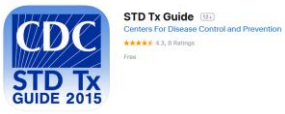
- **Gonorrhea & Chlamydia Testing:**
  - Yearly chlamydia and gonorrhea screening of all sexually active women younger than 25 years, as well as older women with risk factors such as new or multiple sex partners.
- **HIV Testing:**
  - Everyone from 13 to 64 years of age should be tested at least once for HIV.
  - Women who have unsafe sex or share needles should get tested for HIV at least once a year.

(CDC, 2017)

9

CDC Free STD Treatment App

- Apple:
  - https://itunes.apple.com/us/app/std-tx-guide/id655206856?mt=8
- Android:
  - https://play.google.com/store/apps/details?id=gov.cdc.stdtxguide&hl=en



10

Vulvovaginal Candidiasis (VVC)

- Caused by *Candida albicans* but sometimes other *Candida* species or yeasts.
- Symptoms:
  - Itching
  - Vaginal discomfort
  - Dyspareunia
  - External dysuria
  - Vaginal discharge
- VVC is not sexually transmitted. Partner treatment is not required.

(CDC, 2015)

11

Diagnosis

- 1. Wet Prep or Gram Stain with budding yeasts, hyphae, or pseudohyphae
  - Use of 10% KOH in wet prep improves visualization of yeast
  - If wet prep is negative, consider a vaginal culture for *Candida*
- 2. Positive culture for yeast species
  - 10-20% of women have *Candida* in the vagina.
  - If a patient's culture if positive for yeast but she is asymptomatic, no need to treat.

(CDC, 2015)

12

13

14

Uncomplicated VVC Criteria

- Sporadic or infrequent VVC

AND

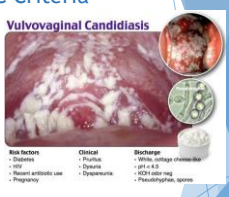
- Mild to moderate VVC

AND

- Likely *Candida albicans*

AND

- Non-immunocompromised



(CDC, 2015)

15

Treatment of VVC: Uncomplicated

- Short-course topical formulations with an azole can be used to treat VVC symptoms in 80-90% of patients.
- Azole drugs more effective than Nystatin.
- Note: Creams and suppositories may weaken latex condoms and diaphragms.

(CDC, 2015)

16

OTC Intravaginal Options for Uncomplicated VVC

- Clotrimazole 1% 5 g intravaginally for 7-14 days
- Clotrimazole 2% 5 g intravaginally for 3 days
- Miconazole 2% 5 g intravaginally for 7 days
- Miconazole 4% 5 g intravaginally for 3 days
- Miconazole 100 mg vaginal suppository daily for 7 days
- Miconazole 200 mg vaginal suppository daily for 3 days
- Miconazole 1,200 mg vaginal suppository for 1 day
- Ticonazole 6.5% ointment 5 g vaginally in a single application

(CDC, 2015)

17

Treatment of VVC: Uncomplicated

- **Prescription Intravaginal Options:**
  - Butoconazole 2% cream 5 g intravaginally in a single application
  - Terconazole 0.4% cream 5 g intravaginally daily for 7 days
  - Terconazole 0.8% cream intravaginally for 3 days
  - Terconazole 80 mg vaginal suppository daily for 3 days
- **Prescription Oral Option:**
  - Fluconazole 150 mg orally in a single dose

(CDC, 2015)

18

Complicated or Severe VVC

- **Complicated VVC:**
  - More common in patients with diabetes, immunocompromised (like HIV), debilitation, or immunosuppressive therapy (such as steroids)
  - Includes patients with recurrent VVC
  - VVC not caused by *Candida albicans* is complicated
  - Obtain cultures for complicated VVC to identify unusual species
- **Severe VVC:** Extensive erythema of the vulva, edema, & excoriation.
  - Requires longer therapy.

(CDC, 2015)

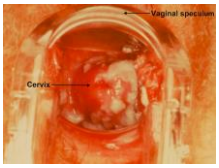
19

Treatment of Complicated or Severe VVC

- 7-14 days of topical azole

OR

- Fluconazole 150 mg in 2 oral doses separated by 72 hours



(CDC, 2015)

20

Treatment of Recurrent VVC

- **Recurrent VVC:** 4 or more episodes of VVC in a year
- **Longer duration of initial therapy:**
  - Topical azole for 7-14 days
    OR
  - Fluconazole 100, 150 or 200 mg on days 1, 4, and 7
- **Maintenance regimen:**
  - Fluconazole (100, 150 or 200 mg) once weekly for 6 months
    Or
  - Intermittent topical azole therapy

(CDC, 2015)

21

Bacterial Vaginosis (BV)

- Caused by alteration of microorganisms in vagina.
  - *Lactobacillus* has been replaced with other bacteria, such as anaerobic bacteria, *Garderella vaginalis*, ureaplasma, or mycoplasma bacteria.
- BV is the most common cause of vaginal discharge with an odor.
- Many women with BV have no symptoms.
- Not a sexually transmitted infection. No need to treat male partners for BV.
- Rarely affects women who have never been sexually active.
- Women with BV are at an increased risk for being infected with HIV, gonorrhea, chlamydia, and herpes.
- Infection with BV increases the risk of pregnancy complications.

(CDC, 2015)

22

Risk Factors for BV

- Multiple male/female sex partners
- New sex partner
- Douching
- Not using condoms
- Lack of vaginal lactobacilli

(CDC, 2015)

23

Diagnosis of BV

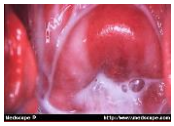
- 1. Gram stain- Gold standard laboratory method but not used often in clinical practice
- 2. Amsel's Criteria- 3 of the following 4 criteria support diagnosis of BV:
  - Homogenous, thin white discharge that smoothly coats vaginal wall
  - Clue cells on wet prep
  - pH of vaginal fluid >4.5
  - + Whiff Test: Fishy odor of vaginal discharge before or after applying 10% KOH

(CDC, 2015)

24

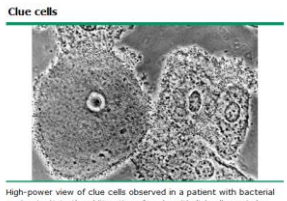
Diagnosis of BV

- 3. If microscopy is not available, the Affirm VP III or OSOM BV Blue Test can be used to diagnose BV.
  - They have high sensitivity and specificity.
- Note: Avoid diagnosing BV based on a cervical pap test or a culture of *Garderella vaginalis*.



(CDC, 2015)

25



High-power view of clue cells observed in a patient with bacterial vaginosis. Note the obliteration of each epithelial cell margin by adherent *Gardnerella vaginalis*.

Courtesy of Jack D Sobel, MD.

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26

Treatment of BV

- 1. Metronidazole 500 mg 1 PO BID for 7 days
  - Avoid alcohol for 24 hours after finishing Metronidazole

OR

- 2. Metronidazole gel 0.75% one applicator (5g) vaginally once a day for 5 days

OR

- 3. Clindamycin cream 2% one applicator (5 g) vaginally at bedtime for 7 days
  - Clindamycin cream is oil-based and may weaken condoms and diaphragms for up to 5 days after use.

(CDC, 2015)

27

Alternative Treatment Regimens for BV

- Tindazole 2 g PO for 2 days
  - Avoid alcohol for 72 hours after completing Tindazole

OR

- Tindazole 1 g PO for 5 days

OR

- Clindamycin 300 mg 1 PO BID for 7 days

OR

- Clindamycin ovules 100 mg intravaginally at bedtime for 3 days
  - Note: Clindamycin ovules may weaken condoms and diaphragms, so avoid use within 72 hours after treatment

(CDC, 2015)

28

First Recurrence of BV

- 30% of women have a recurrence of BV in 3 months
- 50% of women have a recurrence of BV in 12 months
- May fail to get rid of bacteria or do not re-establish normal vaginal flora
- May use the same or a different treatment regimen for first recurrence

(CDC, 2015; Sobel, 2018)

29

Multiple Recurrences of BV

- Consider suppressive therapy if more than 3 documented episodes of BV in the previous 12 months
- 0.75% Metronidazole vaginal gel twice a week for 4-6 months

OR

- Metronidazole or Tindazole 500 mg 1 PO BID for 7 days, followed by Intravaginal boric acid 600 mg daily for 21 days, then 0.75% Metronidazole vaginal gel twice a week for 4-6 months

OR

- Monthly oral Metronidazole 2 g PO along with Fluconazole 150 mg PO

(CDC, 2015)

30

What about Probiotics?

- Probiotics have been used alone or as adjunctive therapy for the treatment of BV and to prevent the relapse of BV.
- Lack of sufficient evidence to advise for or against probiotics for the treatment of BV.
- Need additional studies on probiotics.

(Sobel, 2018)

31

Treatment of BV in Pregnancy

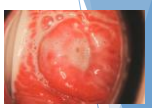
- Adverse pregnancy outcomes are associated with symptomatic BV:
  - Premature rupture of membranes, preterm labor/birth, intraamniotic infection, post-partum endometritis
- Treat all symptomatic pregnant women for BV.
- Inconsistent data on whether to treat asymptomatic BV among pregnant women.
- Pregnant women may be treated with either of the oral or vaginal regimens recommended for non-pregnant women.
- Metronidazole is considered to be low risk in pregnancy.
  - No evidence of teratogenicity or mutagenic effects in infants whose mothers took Metronidazole in pregnancy.

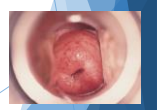
(CDC, 2015)

32

Trichomoniasis (Trich)

- Most prevalent non-viral STD in the US.
- Symptoms:
  - Diffuse, yellow-green or malodorous vaginal discharge
  - With or without vulvar irritation
  - Discharge may be "frothy."
  - Strawberry cervix- erythematous, punctate appearance
  - 70-85% patients have little to no symptoms.
- Infection may last for months to years.
- Associated with 2-3 times increased risk of acquiring HIV.
- Also increases the risk of preterm delivery and other adverse pregnancy outcomes.





(CDC, 2015)

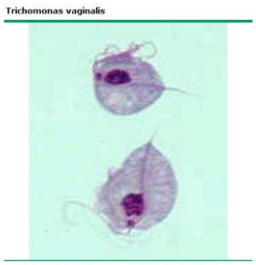
33

Diagnosis of Trich

- Most common way to diagnose trich is on a wet mount.
  - Wet mounts have poor sensitivity (51-65%).
  - Inexpensive and easy to perform if microscopy is available.
- Nucleic acid amplification tests (NAAT) are highly sensitive & specific.
  - Example- APTIMA *T. vaginalis* assay can detect trich from vaginal, endocervical or urine specimens with sensitivity & specificity of 95% or greater
- If wet mounts are used, consider obtaining a NAAT test if wet prep is negative.
- Culture was the gold standard before NAAT tests were available, with a sensitivity of 75-96% and specificity of up to 100%.
- Pap tests are not considered to be diagnostic for trich.

(CDC, 2015)

34



High power microscopy revealing Trichomonas vaginalis with easily identified flagella.
Courtesy of Jack D. Sobel, MD and William E. Secor.

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35

Treatment of Trich

- **Recommended Regimen:**
  - Metronidazole 2 g PO in a single dose

  OR
  - Tindazole 2 g PO in a single dose
- **Alternative Regimen:**
  - Metronidazole 500 mg 1 po BID x 7 days
- **Pregnant Women:**
  - Women may be treated with Metronidazole 2 g PO at any point in pregnancy.
- Avoid alcohol for 24 hours after completing Metronidazole and 48 hours after completing Tindazole
- Avoid Metronidazole gel for treatment of trich

(CDC, 2015)

36

Management Considerations

- Partner must be treated.
- Abstain from sex until partner is treated and all symptoms have resolved.
- Retest women with trich within 3 months after treatment.
- Most cases of recurrent trich are due to reinfection from an untreated partner.
- Avoid single-dose therapy for treating recurrent trich if it's not likely due to reinfection.
  - May treat patient and partner with Metronidazole 500 mg 1 PO BID x 7 days
- If several 1-week regimens have failed, susceptibility testing is needed. Call the CDC for assistance.

(CDC, 2015)

37

Chlamydia

- Most commonly reported infectious disease in the US.
- Caused by bacteria *Chlamydia trachomatis*
- Most commonly seen in patients 24 years of age and younger.
- Sexually transmitted infection.
- Some Possible Consequences in Women:
  - Pelvic inflammatory disease (PID)
  - Ectopic Pregnancy
  - Infertility

(CDC, 2015)

38

Chlamydia — Rates of Reported Cases by State, United States and Outlying Areas, 2017

NOTE: The total rate of reported cases of chlamydia for the United States and outlying areas (including Guam, Puerto Rico, and the Virgin Islands) was 525.1 per 100,000 population. See Section A1.11 in the Appendix for more information on interpreting reported rates in the outlying areas.
ACRONYMS: GU = Guam; PR = Puerto Rico; VI = Virgin Islands.

39

Symptoms of Chlamydia

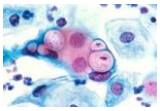
- Women may have vaginal discharge.
  - May be mucopurulent
- May have intermenstrual bleeding or bleeding after sex.
- Cervix may be friable on exam.
- However, 85% of women are asymptomatic.
  - Important to screen sexually active women under age 25 annually.

40

41

Diagnosis of Chlamydia

- NAATs are the most sensitive tests for diagnosis of chlamydia.
- Self-collected vaginal swabs using NAATs have similar sensitivity and specificity to those collected by a provider.
- Diagnosed in women by urine or endocervical or vaginal swabs.
- Chlamydia can also be diagnosed at rectal or oral sites.



(CDC, 2015)

42

Treatment of Chlamydia

Recommended Regimen

- Azithromycin 1 g PO in a single dose

OR

- Doxycycline 100 mg 1 PO BID x 7 days

Note: *Dual treatment **not** required.*

Azithromycin recommended in pregnancy

Alternative Regimen

- Erythromycin base 500 mg 1 PO 4 times per day for 7 days

OR

- Erythromycin ethysuccinate 800 mg 1 PO 4 times per day for 7 days

OR

- Levofloxacin 500 mg 1 PO once daily for 7 days

OR

- Ofloxacin 300 mg 1 PO BID x 7 days

(CDC, 2015)

43

Management Considerations

- Directly observed treatment with Azithromycin in a single dose may increase adherence. Use recommended regimen first line.
- Any partners from past 60 days must be treated.
- Abstain from sex until 7 days after partner is treated and all symptoms have resolved.
- Patients who are positive for chlamydia should be tested for gonorrhea, HIV, and syphilis.
- Retest women with chlamydia 3 months after treatment.
- Repeat chlamydia infections increase the risk for PID and other complications.
- SC does not allow NPs to prescribe partner treatment without seeing the patient. See https://www.cdc.gov/std/ept/legal/southcarolina.htm

(CDC, 2015; CDC 2018a)

44

Gonorrhea

- 2nd most commonly reported communicable disease.
- Due to bacteria *Neisseria gonorrhea*
- In women, gonorrhea is more likely to be asymptomatic than in men.
- Women may not have symptoms until PID develops.
- Issue of increasing antibiotic resistance.
- Resistant to most antibiotics now.

CDC, 2015)

45

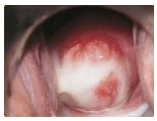
Gonorrhea — Rates of Reported Cases by State, United States and Outlying Areas, 2017

NOTE: The total rate of reported cases of gonorrhea for the United States and outlying areas (including Guam, Puerto Rico, and the Virgin Islands) was 170.3 per 100,000 population. See Section A1.11 in the Appendix for more information on interpreting reported rates in the outlying areas.
ACRONYMS: GU = Guam; PR = Puerto Rico; VI = Virgin Islands.

46

Symptoms of Gonorrhea

- Mucopurulent discharge may be present.
- Cervix may be friable.
- Intermenstrual bleeding or menorrhagia may occur.
- Up to 70% of women with gonorrhea are asymptomatic.

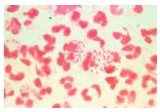


47

48

Diagnosis of Gonorrhea

- The sensitivity of NAATs for detection of gonorrhea is superior to culture.
  - May test endocervical or vaginal swabs or do urine testing in women for gonorrhea.
- A culture of the endocervical swab or urethral swab can also be performed.
- Gram stain of the urethral secretions can be used to detect gonorrhea.
  - Do not use gram stains from other sites.
  - Low sensitivity for gram stains of endocervical, pharyngeal and rectal specimens.



(CDC, 2015)

49

Treatment of Gonorrhea

Recommended Regimen

- Ceftriaxone 250 mg IM now

PLUS

- Azithromycin 1 g PO now

Note: Dual treatment is required.

Recommended regimen may be given in pregnancy

Alternative Regimen

- If ceftriaxone is not available- Cefixime 400 mg 1 po now

  PLUS Azithromycin 1 po PO now
- If patient is allergic to azithromycin, may give Doxycycline 100 mg 1 PO BID x 7 days PLUS Ceftriaxone or Cefixime.
- Avoid Ceftriaxone or Cefixime if patient had an anaphylactic reaction or Steven's Johnson Syndrome after taking PCN.

(CDC, 2015)

50

Management Considerations

- Use recommended regimen as your first-line therapy.
- Any partners from past 60 days must be treated.
- Abstain from sex until 7 days after partner is treated and all symptoms have resolved.
- Patients who are positive for gonorrhea should be tested for chlamydia, HIV, and syphilis.
- Retest women with gonorrhea 3 months after treatment.
- SC does not allow NPs to prescribe partner treatment without seeing the patient. See https://www.cdc.gov/std/ept/legal/southcarolina.htm

(CDC 2015, CDC 2018a)

51

Possible Gonorrhea Treatment Failures

- Most possible gonorrhea treatment failures in the US are actually reinfections.
- If treatment failure is suspected rather than reinfection, obtain a culture and perform antimicrobial susceptibility testing.
- Contact CDC for advice.
- Send cultures of possible treatment failures to the CDC.

(CDC, 2015)

52

Pelvic Inflammatory Disease (PID)

- Infection of the upper female genital tract.
- Can cause endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis.
- 85% of cases of PID are caused by sexually transmitted microorganisms such as gonorrhea or chlamydia, or bacterial vaginosis-associated pathogens.

(Ross & Chacko, 2018)

53

PID Risk Factors and Presentation

- Risk Factors for PID:
  - Multiple sexual partners are at the highest risk
  - Age younger than 25
  - A partner with a sexually transmitted infection
  - History of prior PID or a sexually transmitted infection
- Presentation time varies:
  - Acute over several days
  - Or it may be a slower presentation over weeks to months

54

Symptoms of PID

- Lower abdominal pain - main presenting symptom
  - May be subtle or severe
  - Usually less than 2 weeks duration
  - Usually bilateral
  - Pain may be worse with sex
  - May occur during or right after menstrual period
- Abnormal uterine bleeding - occurs in 1/3 or more patients with PID
  - May occur after sex, between menstrual periods or woman may have heavier periods
- Abnormal vaginal discharge
- Urinary frequency
- Fever usually occurs with severe PID

(Ross & Chacko, 2018)

55

Examination

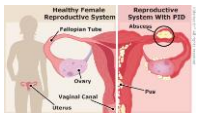
- All women suspected of having PID should have a pelvic/bimanual exam.
- Testing should include:
  - Pregnancy test
  - Wet prep of vaginal discharge (if available)
  - Nucleic acid amplification tests (NAATs) for chlamydia & gonorrhea
  - HIV screening
  - Serologic testing for syphilis
- May make a presumptive diagnosis based on history and physical exam.
- Do not delay treatment while waiting for gonorrhea & chlamydia test results.
- Maintain a high index of suspicion for PID among young, sexually active females.

(Ross & Chacko, 2018)

56

Diagnosis of PID

- May treat presumptively for PID if a sexually active female has pelvic or lower abdominal pain and has 1 or more of the following criteria:
  - Cervical motion tenderness
  - Uterine tenderness
  - Adnexal tenderness



(CDC, 2015)

57

Supporting Criteria for PID

- Criteria supporting a diagnosis of PID:
- Increases the specificity of PID diagnosis (but are not required):
  - Oral temperature above 101 degrees F
  - Mucopurulent cervical discharge or friable cervix
  - Increased WBCs on wet prep
  - Elevated C Reactive Protein (CRP) or Elevated Erythrocyte Sedimentation Rate (ESR) but these not very specific
  - Documented infection with gonorrhea or chlamydia

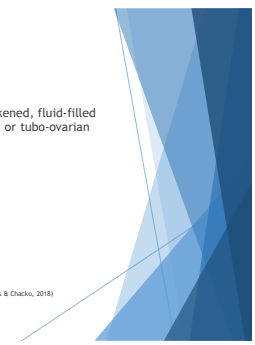
(CDC, 2015)

58

Additional Tests

- Additional tests if the diagnosis is uncertain:
  - Transvaginal ultrasound, MRI or CT showing thickened, fluid-filled tubes/oviducts with or without free pelvic fluid, or tubo-ovarian complex
  - Laparoscopic abnormalities consistent with PID
  - Histologic evidence of endometritis in a biopsy.

(Ross & Chacko, 2018)

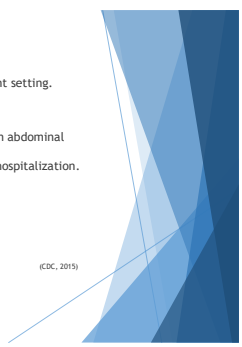


59

PID Treatment

- Most patients with PID can be treated in the outpatient setting.
- Close follow-up is important.
  - Re-evaluate patient within 48-72 hours.
  - There should be clinical improvement (reduction in abdominal tenderness and cervical motion tenderness).
  - If no improvement, need further evaluation &/or hospitalization.

(CDC, 2015)



60

Hospitalization for PID

- When is hospitalization needed?
  - Cannot exclude appendicitis or another surgical emergency
  - Tubo-ovarian abscess
  - Pregnancy
  - Severe illness, nausea, vomiting or high fever
  - Cannot tolerate oral regimen
  - No response to oral antibiotics

(CDC, 2015)

61

Outpatient Treatment for PID

- **Option 1:**
  - Ceftriaxone 250 mg IM

  PLUS
  - Doxycycline 100 mg 1 PO BID x 14 days

  WITH or WITHOUT
  - Metronidazole 500 mg 1 PO BID x 14 days

(CDC, 2015)

62

Outpatient Treatment for PID

- **Option 2:**
  - Cefoxitin 2 g IM AND Probenecid 1 g PO a single dose at the same time

  PLUS
  - Doxycycline 100 mg 1 PO BID x 14 days

  WITH or WITHOUT
  - Metronidazole 500 mg 1 PO BID x 14 days

(CDC, 2015)

63

Outpatient Treatment for PID

- **Option 3:**
  - Other 3rd generation cephalosporin (like cefotaxime)

  PLUS
  - Doxycycline 100 mg 1 PO BID x 14 days

  WITH or WITHOUT
  - Metronidazole 500 mg 1 PO BID x 14 days

(CDC, 2015)

64

Management Considerations

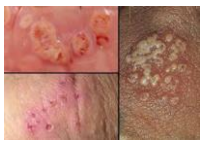
- All women diagnosed with PID should be tested for HIV, gonorrhea, and chlamydia.
- Women who test positive for gonorrhea or chlamydia should be re-tested 3 months after treatment.
- Women with PID should abstain from sex until therapy has been completed, symptoms are better, and partners have been treated.

CDC, 2015)

65

Genital Herpes

- Caused by Herpes Simplex Virus (HSV)
  - 2 types: HSV 1 and HSV 2
  - Most cases of recurrent genital herpes are caused by HSV 2
  - Growing number of genital herpes infections due to HSV 1
- Sexually transmitted
- Transmission can occur when symptoms are absent or when lesions are present.
- Most infections are transmitted by people who are unaware that they are infected with HSV.



(Albrecht, 2018)

66

Symptoms of Genital Herpes

- **Primary Infection:**
  - Presentation may vary
  - May be severe:
    - Multiple painful vesicular or ulcerated genital lesions
    - Dysuria
    - Fever
    - Tender inguinal lymphadenopathy
    - Headache
  - However, primary infection be mild, subclinical or with no symptoms
  - Average incubation after exposure if 4 days (range from 2 to 12 days)
- **Recurrent Infection:**
  - Typically less severe symptoms than primary episode

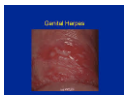
(Albrecht, 2018)

67

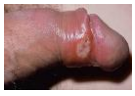
Other Potential Diagnoses

- Herpes is caused by Herpes Simplex Virus (HSV):
  - Multiple, shallow, tender ulcers that may be vesicular, may be recurrent
- Primary syphilis is caused by *Treponema pallidum*:
  - A painless, indurated, clean-based ulcer, called a chancre.
- Chancroid is caused by *Haemophilus ducreyi* :
  - Deep, undermined, purulent ulcer that may be associated with painful inguinal lymphadenitis (rare).

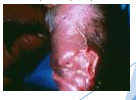
(Albrecht, 2018)



Herpes



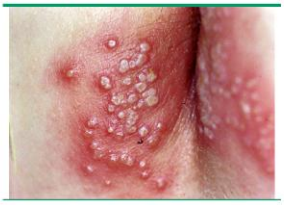
Primary Syphilis



Chancroid

68

Primary genital herpes simplex infection



Courtesy of Lynne J Margesson, MD.

UpToDate

69

Diagnosis of Genital Herpes

- Screening for HSV-1 and HSV-2 in the general population is not indicated.
- Need to confirm clinical diagnosis with lab testing.
- Herpes culture and PCR-based testing are the best tests when a patient has active genital lesions.
- Herpes culture- sensitivity only 50%. Less sensitive as lesions begin to heal.
- PCR testing more expensive than viral cultures but more sensitive
- Direct immunofluorescence antibody- less sensitive
- Consider type-specific serologic tests if:
  - 1) Recurrent genital herpes symptoms with negative HSV PCR or culture
  - 2) Clinical diagnosis of genital herpes without a lab confirmation
  - 3) Partner with genital herpes

(CDC, 2015)

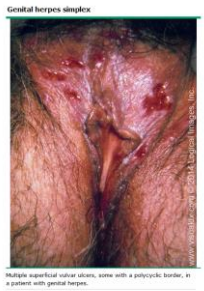
70

Genital Ulcer Evaluation

- Clinical diagnosis alone is not adequate.
- Evaluation of genital, anal, or perianal ulcers should include:
  - 1) Syphilis testing
  - 2) Culture or PCR testing for genital herpes
  - 3) Serologic testing for type-specific HSV antibody.
  - 4.) Test for *Haemophilus ducreyi* if chancroid prevalent
- Early treatment of syphilis can reduce transmission.
- Herpes is successfully treated as soon as symptoms occur.
- Treat any patient with a suspected case of infectious syphilis or herpes at the initial visit, even before test results are available.

(CDC, 2015)

71



72

Treatment of First Episode of HSV 2

- All patients with first episode of herpes should receive antiviral treatment.
  - Acyclovir 400 mg 1 po TID for 7-10 days

  OR
  - Acyclovir 200 mg 1 po 5 times per day for 7-10 days

  Or
  - Famiciclovir 250 mg 1 PO TID for 7-10 days
- Note: May extend treatment if healing is not complete after 10 days of medication

(CDC, 2015)

73

Episodic Therapy for Recurrent HSV 2 Infection

Provide patient with prescription to take when symptoms begin:

- Acyclovir 400 mg 1 po TID for 5 days

OR
- Acyclovir 800 mg 1 po BID for 5 days

OR
- Acyclovir 800 mg 1 po TID for 2 days

OR
- Valacyclovir 500 mg 1 po BID for 3 days
- Valacyclovir 1 g PO daily for 5 days

OR
- Famiciclovir 125 mg 1 po BID for 5 days

OR
- Famiciclovir 1 g PO BID for 1 day

OR
- Famiciclovir 500 mg once, followed by 250 mg 1 po BID for 2 days

(CDC, 2015)

74

Suppressive Therapy for Recurrent HSV 2

- Suppressive therapy reduces frequency of recurrences by 70-80% in patients with frequent outbreaks. Consider offering to patients who have 6 or more episodes per year.

- Acyclovir 400 mg 1 po BID

OR
- Valacyclovir 500 mg 1 po daily

Or
- Valacyclovir 1 g PO daily

OR
- Famiciclovir 250 mg 1 po BID

**Less effective for suppression of viral shedding*

(CDC, 2015)

75

Management Considerations

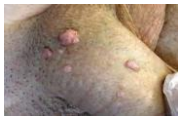
- Counsel patients and their partners about herpes, including coping and prevention of sexual transmission.
- Counsel patients that viral shedding may occur when lesions are not present.
- Discuss need to abstain from sex when lesions are present.
- Asymptomatic partners can be offered type-specific serologic testing.
- Symptomatic partners should be evaluated.
- Patients with herpes are at increased risk of HIV.
- Patients who have genital herpes should be tested for gonorrhea, chlamydia, HIV, and syphilis.

(CDC, 2015)

76

Genital Warts

- High-risk human papillomavirus (HPV) causes most cervical, penile, vulvar, vaginal, anal, and oropharyngeal cancers.
- Low-risk HPV causes 90% of genital warts.
- HPV testing should be used in in the context of cervical cancer screenings.
- HPV tests should not be ordered to diagnose genital warts or as a routine STD test.

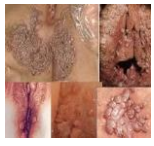


(CDC, 2015)

77

Genital Warts

- Usefully non-painful and non-pruritic.
- Flat, papular, or pedunculated growths on the genital mucosa.
  - May look like cauliflower.
- Diagnosis usually made on clinical appearance.
- Genital warts may resolve on their own in up to 1 year.



(CDC, 2015)

78

79

Recommended Regimens for Genital Warts

- **Patient Applied:**
- Imiquimod 3.75% or 5% cream

OR

- Podofilox 0.5% solution or gel

Or

- Sinecatechins 15% ointment

- **Provider Applied:**
- Cryotherapy with liquid nitrogen or cryoprobe

OR

- Surgical removal

OR

- Trichloroacetic acid (TCA) or bichloroacetic acid (BCA) 80-90% solution

(CDC, 2015)

80

Management Considerations

- Counsel patients and their partners about genital wats, including coping and prevention of sexual transmission.
- HPV testing of sex partners is not recommended. Partners should be evaluated.
- Curing the warts does not get remove the virus. Genital warts may recur.
- Women with genital warts do not need more frequent pap testing.
- Discuss need to abstain from sex when lesions are present.
- Patients who have genital warts should be tested for gonorrhea, chlamydia, HIV, and syphilis.

(CDC, 2015)

81

Human Papillomavirus (HPV)

- HPV is a sexually transmitted infection.
- High-risk HPV types 16 & 18 cause 70% of cervical cancers.
- HPV types 16 & 18 also cause 90% of anal cancers and a large percentage of oropharyngeal cancer, vulvar/vaginal cancer, and penile cancers.
- HPV types 31, 33, 45, 52, & 58 cause an additional 20% of cervical cancer cases.
- HPV types 6 & 11 cause 90% of warts.

(Cox & Palefsky, 2018)

82

3 Different HPV Vaccines

- Bivalent (Cervarix): Protects against HPV 16 & 18
- Quadrivalent (Gardasil): Protects again HPV 6, 11, 16 & 18
- 9-Valent (Gardasil 9): Protects again HPV 6, 11, 16, 18, 31, 33, 45, 52, 58
- Only 9-valent vaccine currently available in the United States
- If the HPV vaccine formulation is unknown or not available, you may finish the series with the 9-valent.

CDC, 2018; Cox & Palefsky, 2018)

83

HPV Vaccine

- HPV vaccine is routinely recommended for girls and boys at ages 11 or 12.
- Can be started as early as age 9.

(Centers for Disease Control and Prevention [CDC], 2018b)

84

Vaccination of Young Adults

- Vaccination recommended for females through age 26.
- Males may be routinely vaccinated through age 21.
- Males aged 22 through 26 years may be vaccinated if:
  - Immunocompromised
  - Gay, bisexual, and other men who have sex with men (MSM) or transgender persons.
  - Males ages 22-26 may receive the vaccine if they desire protection

(CDC, 2018b)

85

Vaccination of Adults Over Age 26

- On October 5, 2018, The Food and Drug Administration (FDA) approved the 9-valent HPV vaccine to include women and men ages 27 to 45 years of age.
- The vaccine is considered to be safe and effective in patients above age 26.
- The CDC's Advisory Committee on Immunization Practices (ACIP) is reviewing the available data, but they have not changed their recommendations at this point.
  - There may be a decision by ACIP in 2019.

(FDA, 2018; American College of Obstetricians and Gynecologists, 2018)

86

2 Dose vs. 3 Dose Series

- 2 dose series for patients who are vaccinated from ages 9 to 14 years:
  - Administer first dose, 2nd dose at 6-12 months
- 3 dose series for patients who are vaccinated from ages 15-26 years or anyone who is immunocompromised:
  - Administer first dose, 2nd dose after 1-2 months, then 3rd dose at 6 months

(CDC, 2018b)

87

Administration

- Intramuscular (IM) injection in deltoid of upper arm
- May be given with other vaccines

(CDC, 2018b)

88

Precautions and Contraindications: HPV Vaccine

- Do not administer HPV vaccine if a patient is allergic to yeast.
- Do not give HPV vaccine to a woman who is pregnant.
  - If the HPV vaccine is given during pregnancy, no intervention is needed.
  - No need to do a pregnancy test prior to HPV vaccine.
  - If patient becomes pregnant during the HPV series, delay the rest of the HPV vaccine doses until after delivery.

(CDC, 2018b)

89

What about Pap Testing?

- Cervical cancer screening is recommended in women ages 21 to 65 years.
- This recommendation is the same even if patients previously have received the HPV vaccine.

(CDC, 2018b)

90

Insurance Coverage

- All vaccines recommended by the Advisory Committee on Immunization Practices (ACIP) are covered by insurance.
- HPV vaccination is recommended by ACIP up to age 26, so it is covered by insurance.
- The FDA's expanded ages of 27-45 for the HPV vaccine are not currently under ACIP recommendations.
- The Vaccines for Children Program (VFC) provides vaccines to children 18 and under who are uninsured, have Medicaid, or are American Indian/Alaska Native.

(CDC, 2018b)

91

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92

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93