

**St. Louis STD / HIV Prevention  
Training Center**

**STD Clinical Practices Manual  
2003 - 2004**

**Current Diagnosis and Therapy of  
Sexually Transmitted Diseases**

Fifth Edition  
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Prepared by:

Bradley P. Stoner, MD, PhD  
Associate Professor of Anthropology and Medicine  
Washington University in St. Louis  
Chief of STD Services, St. Louis County Department of Health  
Medical Director, St. Louis STD / HIV Prevention Training Center

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# INTRODUCTION

This is the 5<sup>th</sup> edition of the STD clinical practices manual, originally produced to standardize and routinize STD clinical care at the John C. Murphy STD Clinic in St. Louis County, Missouri. More broadly, these practices and procedures form the basis of STD clinical training offered in courses through the St. Louis STD/HIV Prevention Training Center. The manual serves as a useful reference text for health care providers in our own clinics, as well as those who attend any of our didactic and practicum STD training sessions. These include physicians, mid-level providers, and nurses throughout Public Health Service Region VII (Missouri, Iowa, Kansas, Nebraska), as well as medical students, residents, and fellows from the local medical schools (Washington University, St. Louis University) who rotate through the St. Louis city and county STD clinics.

The guidelines and protocols contained herein are based upon the recently-released *Sexually Transmitted Diseases Treatment Guidelines 2002* (MMWR Vol. 51, No. RR-6) of the federal Centers for Disease Control and Prevention (CDC). A number of updated treatment regimens and recommendations are included in this version of the manual.

The manual is organized in such a way as to permit rapid access to diagnostic and therapeutic information. Where possible, disease categories are grouped syndromically. Providers are urged to adopt syndromic diagnoses when specific microbiological etiology may be in doubt (e.g. nongonococcal urethritis). Specific protocols and treatment recommendations will be continued to be included in future editions of the manual, as new data become available and are incorporated into standard clinical practice.

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Bradley P. Stoner, MD, PhD  
St. Louis, March 2003

# STANDARD APPROACH TO THE STD CLINIC PATIENT

The standard evaluation of patients in the STD clinic includes essential aspects of history, physical examination, and laboratory examination. The following procedures should be performed on all patients seeking care for STD services.

## I. HISTORY

### A. Reason for visit

### B. Symptoms present

1. Chief complaint
2. Other symptoms
3. Duration of symptoms
4. Presence or absence of:

#### Males

Discharge  
Dysuria  
Ulcers / sores / lesions  
Warts / growths / bumps  
Rash  
Itching  
Testicular sx  
Oral / pharyngeal sx

#### Females

Discharge  
Odor  
Bleeding  
Dysuria (internal vs.  
external)  
Ulcers / sores / lesions  
Warts / growths / bumps  
Rash  
Itching  
Abd / pelvic / rectal pain  
Oral / pharyngeal sx

### C. Sexual exposure history

1. Sex with men, women, or both
2. Number of partners in past year (3 months, 1 month)
3. Sites of exposure: vaginal-penile, oral, anal
4. Condom use
5. Known contact to STD ?
6. Is partner here today ?

- D. History of prior STD
  - 1. Last clinic visit
  - 2. Prior diagnosis and treatment
- E. Medical allergies
- F. Current / past medications within 1 month
- G. Males: time since last void
- H. Females
  - 1. Last menstrual period
  - 2. Form of contraception

## II. PHYSICAL EXAMINATION

### A. Male patients

- 1. Exam of skin: lower abdomen, inguinal areas, thighs, hands, palms, forearms
- 2. Exam of mouth, throat and tongue for ulcers, pharyngitis
- 3. Exam of pubic area and penis, including retraction of foreskin and "milking" of urethra for discharge
- 4. Palpation of scrotal contents
- 5. Palpation for inguinal and femoral lymphadenopathy; include other lymph node groups if patient at high risk for HIV
- 6. Inspection of anus; anoscopy may be indicated if proctitis or proctocolitis suspected

### B. Female Patients

- 1. Exam of skin: lower abdomen, inguinal areas, thighs, hands, palms, forearms
- 2. Exam of mouth, throat and tongue for ulcers, pharyngitis
- 3. Exam of external genitalia, pubic area, perineum, and anus
- 4. Palpation for inguinal and femoral lymphadenopathy; include other lymph node groups if patient at high risk for HIV
- 5. Speculum examination of vagina and cervix
- 6. Palpation of lower abdomen and bimanual pelvic examination

### III. LABORATORY TESTING

#### A. Male patients

1. Urethral Gram-stained smear
2. Formal urethral testing for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* by one of the following methods:
  - a. Nucleic acid amplification test (NAAT) for *N. gonorrhoeae* and *C. trachomatis* (may be performed on urethral or first-catch urine specimens); **OR**
  - b. Urethral culture for gonorrhea (and, if available, culture for chlamydia)
3. Syphilis serology if not performed within previous 1 month
4. HIV counseling and testing offered to all patients
5. If indicated: rectal and/or pharyngeal culture for *N. gonorrhoeae*
6. If genital ulcers present:
  - a. Darkfield examination for syphilis
  - b. Viral culture for HSV
  - c. Perform *stat* RPR while patient waits in clinic
  - d. Consider culture for *Haemophilus ducreyi*
7. Consider HSV serotesting if available

#### B. Female patients

1. Endocervical Gram-stained smear
2. Formal endocervical testing for *Neisseria gonorrhoeae* and *Chlamydia trachomatis* by one of the following methods:
  - a. Nucleic acid amplification test (NAAT) for *N. gonorrhoeae* and *C. trachomatis* (may be performed on endocervical or first-catch urine specimens); **OR**
  - b. Endocervical culture for gonorrhea (and, if available, culture for chlamydia)

3. Vaginal secretions for:
  - a. pH
  - b. saline wet mount microscopic examination
  - c. KOH amine odor (“whiff test”)
  - d. KOH microscopic examination for fungal elements / yeast
4. Syphilis serology if not performed within previous 1 month
5. HIV counseling and testing offered to all patients
6. If indicated: rectal and/or pharyngeal culture for *N. gonorrhoeae*
7. If genital ulcers present:
  - a. Darkfield examination for syphilis
  - b. Viral culture for HSV
  - c. Perform *stat* RPR while patient waits in clinic
  - d. Consider culture for *H. ducreyi*
8. Consider HSV serotesting if available

# URETHRITIS AND CERVICITIS SYNDROMES

## I. GONORRHEA

### A. Clinical picture

Gonorrhea (GC, gonococcal infection) typically causes urethritis in males and cervicitis in females, although females can also present with symptoms of urethral involvement. Symptoms in males generally include purulent urethral discharge and dysuria, although asymptomatic disease does occur in males. Vaginal discharge in females often occurs, but many women are asymptomatic. Gonococcal cervicitis can also cause cervical friability. The causative agent of gonorrhea is *Neisseria gonorrhoeae*. Standard culture requires incubation on chocolate agar media in a CO<sub>2</sub>-enriched environment. Gonorrhea rates have increased in St. Louis in recent years. In 2001, the City of St. Louis reported 3185 cases of gonorrhea, giving it the 2<sup>nd</sup> highest *per capita* rate of infection among large US cities (915 cases per 100,000 pop.).

### B. Diagnosis

1. Genital tract infection documented by **ANY ONE** of the following criteria (a, b, **or** c):
  - a. Gram-stained urethral or endocervical smear showing polymorphonuclear leukocytes (PMNs) with typical Gram-negative intracellular diplococci (GNIDs);  
**OR**
  - b. Urethral or endocervical culture positive for *N. gonorrhoeae*; **OR**
  - c. Nucleic acid amplification test (NAAT) positive for *N. gonorrhoeae*
  
2. Anorectal infection documented by **EITHER** of the following criteria (a **or** b):
  - a. Anoscopic Gram-stained smear showing GNIDs; **OR**
  - b. Positive rectal culture for *N. gonorrhoeae*

3. Pharyngeal infection documented **ONLY** by positive pharyngeal culture for *N. gonorrhoeae*
  - a. Pharyngeal culture indicated for symptomatic patients (i.e. sore throat) who have performed fellatio or cunnilingus, and for all patients (symptomatic or asymptomatic) with a history of orogenital contact with a patient with known or suspected genital gonorrhea
  - b. Pharyngeal Gram stain not specific for gonorrhea due to colonization with oral *Neisseria* and related species
  - c. Nucleic acid tests ineffective for oropharyngeal testing; use standard culture only

### C. Treatment

Effective treatment of gonorrhea routinely includes a single-dose antigonococcal agent **PLUS** a course of therapy to eradicate possible co-infection with *C. trachomatis* (both 1 **and** 2 below). In general, oral antibiotics are the therapy of choice for routine treatment of uncomplicated gonococcal infections. Oral agents are highly effective, preferred by most patients, and eliminate potential needle-stick hazards to medical personnel. CDC guidelines now allow withholding empiric chlamydial therapy if a sensitive chlamydia test can be obtained, the likelihood of chlamydial infection is low, and follow-up can be assured. In most cases, however, dual therapy is indicated.

Antimicrobial resistance continues to be a problem. Approximately 20% of U.S. strains are resistant to penicillin, tetracycline, or both. High rates of quinolone-resistant *N. gonorrhoeae* (QRNG) have been documented in Asia and the Pacific Islands, and QRNG rates are increasing in Hawaii and California. Therefore, **quinolone antibiotics should NOT be used for gonococcal infections which may have been acquired in California, Hawaii, or Asia and the Pacific Islands.** New data suggest that use of single-dose ciprofloxacin in adolescents is probably safe and effective (*Clin. Inf. Dis.* 2002; 35 (Suppl. 2):S191-199). Single-dose quinolone therapy in adolescents may be considered on a case-by-case basis.

U.S. manufacture and distribution of cefixime was discontinued in 2002. Also, azithromycin 2.0 gm single-dose oral therapy is effective but not recommended due to high rate of gastrointestinal side effects.

1. Single-dose antigonococcal therapy  
Recommended
  - a. Cephalosporin: Cefixime<sup>§</sup> 400 mg PO; **OR**  
Ceftriaxone 125 mg IM; **OR**
  - b. Quinolone: Ciprofloxacin\* 500 mg PO; **OR**  
Ofloxacin\* 400 mg PO; **OR**  
Levofloxacin\* 250 mg PO
2. **PLUS:** Routine concomitant (dual) treatment with an antichlamydial agent
  - a. Azithromycin 1.0 g PO (single dose); **OR**
  - b. Doxycycline<sup>‡</sup> 100 mg PO bid for 7 days
3. Alternative antigonococcal regimens include
  - a. Spectinomycin 2 g IM (expensive, difficult to obtain, must be given IM)
  - b. Other single-dose cephalosporin (e.g. ceftizoxime, cefoxitin + probenecid, cefotaxime)
  - c. Other single-dose quinolone (e.g. gatifloxacin, norfloxacin, lomefloxacin, moxifloxacin)
4. Treat pharyngeal infection with either ceftriaxone or ciprofloxacin
5. Penicillin allergy
  - a. Late onset, atypical, or undocumented allergy: prefer fluoroquinolone, but safe to use cephalosporin
  - b. History of anaphylaxis, immediate hives, etc.: treat with fluoroquinolone only; do not use cephalosporin

<sup>§</sup>U.S. manufacture and distribution of cefixime discontinued in 2002.

\*Quinolones contraindicated in pregnant or nursing women. Single-dose therapy may be considered in adolescents <18 years of age on a case-by-case basis. Avoid quinolones to treat gonococcal infections which may have been acquired in California, Hawaii, or Asia / Pacific Islands.

<sup>‡</sup>Doxycycline contraindicated in pregnancy.

6. Suspected disseminated gonococcal infection (DGI): refer to inpatient medical facility for admission. Inpatient care will include culture of blood, mucosal sites, skin lesions, and joint aspirates. Patients should be treated with ceftriaxone 1.0 g IV or IM once daily until clinical improvement, then should complete a 10-14 day course of oral therapy.

#### **D. Sex partners**

1. Refer for evaluation and empiric treatment all sex partners within 60 days of onset of symptoms or diagnosis
2. If last sexual contact > 60 days, refer most recent partner
3. Consider referral of "high-risk" patients to disease intervention specialist (DIS) for routine partner notification:
  - a. Age < 16 years
  - b. Treatment failure vs. reinfection (persistent gonorrhea)
  - c. Patients with gonorrhea complications (e.g. PID, DGI)
  - d. Patients with 2<sup>nd</sup> episode within 1 year ("repeaters")
  - e. Patients requiring DIS assistance in locating or notifying sex partners
4. Abstain from sexual contact until 7 days after therapy is initiated

## II. CHLAMYDIAL INFECTION

### A. Clinical picture

Infection with *Chlamydia trachomatis* is a major cause of urethritis in males and cervicitis in females. Symptoms may include mucoid urethral discharge and/or dysuria in males, and vaginal discharge in females, although many infections remain asymptomatic. Laboratory findings may include evidence of urethral or cervical inflammation (PMNs). Currently there is no available test to diagnose chlamydial infection at the time of STD clinic visit. Nongonococcal urethritis (NGU) in males and mucopurulent cervicitis (MPC) in females *may* be caused by chlamydia, but most cases are not chlamydial in nature. Chlamydia rates have increased in St. Louis in recent years. In 2001, the City of St. Louis reported 3195 cases of chlamydia, giving it the 3<sup>rd</sup> highest *per capita* rate of infection among large US cities (918 cases per 100,000 pop.).

### B. Diagnosis

Infection of the genital tract infection may be documented by **ANY ONE** of the following criteria (1, 2, or 3):

1. Nucleic acid amplification test (NAAT) positive for *C. trachomatis*; **OR**
2. Direct fluorescent antibody test (DFA) positive for *C. trachomatis*; **OR**
3. Urethral or endocervical culture positive for *C. trachomatis* (culture is difficult, not widely available)

### C. Treatment

#### Recommended

1. Azithromycin 1.0 g PO, single dose; **OR**
2. Doxycycline<sup>‡</sup> 100 mg PO bid for 7 days

<sup>‡</sup>Doxycycline contraindicated in pregnancy.

### Alternative

3. Erythromycin base<sup>§</sup> 500 mg PO qid for 7 days; **OR**
4. Erythromycin ethyl succinate<sup>§</sup> 800 mg PO qid for 7 days; **OR**
5. Ofloxacin\* 300 mg PO bid for 7 days; **OR**
6. Levofloxacin\* 500 mg PO daily for 7 days
  
7. Chlamydial infection in pregnancy  
Single-dose azithromycin is probably safe and effective for use in pregnancy, based on clinical experience and preliminary data. CDC recommends erythromycin dosages as above, or amoxicillin 500 mg PO tid for 7 days. Repeat chlamydial testing is indicated at 3 weeks (test of cure) since these regimens are less effective than azithromycin or doxycycline.
8. **Repeat infection is common; CDC now recommends routine rescreening of all women with chlamydial infection 3-4 months after treatment.**

### **D. Sex partners**

1. Refer for evaluation and empiric treatment all sex partners within 60 days of onset of symptoms or diagnosis
2. Treat most recent sex partner, even if last sexual contact was greater than 60 days
3. Abstain from sexual contact until 7 days after therapy is initiated

<sup>§</sup>In case of severe GI intolerance with erythromycin, give the drug with food, halve the dose, and double the duration of therapy (14 days).

\*Quinolones contraindicated in pregnant or nursing women. Avoid multiple-dose quinolone therapy for adolescents < 18 years of age.

### III. NONGONOCOCCAL URETHRITIS

#### A. Clinical picture

Nongonococcal urethritis (NGU) is characterized by the development of an inflammatory urethral response (discharge, dysuria, PMNs) in the absence of gonococcal infection. Many cases of NGU are caused by *C. trachomatis*, but most cases are chlamydia-negative. Other agents implicated include *Mycoplasma genitalium*, *Mycoplasma hominis*, *Ureaplasma urealyticum*, *Trichomonas vaginalis*, and occasionally herpes simplex virus. Typically, the urethral discharge of NGU is less purulent and more mucoid than that seen in gonococcal infections, although aggressive infections may generate quite a purulent discharge which mimics gonorrhea. Initial treatment regimens are centered around providing adequate coverage for possible *C. trachomatis* infection. Consideration should be given to providing treatment for *T. vaginalis* infection in persons who do not respond to antichlamydial therapy.

#### B. Diagnosis

1. Document urethritis by at least **two** of the following (a plus b, **or** a plus c, **or** b plus c):
  - a. Symptoms: History of urethral discharge and/or dysuria
  - b. Examination: Presence of purulent or mucopurulent urethral discharge
  - c. Laboratory documentation of urethral inflammation:
    1. Urethral Gram-stained smear showing  $\geq 5$  PMNs per 1000X (oil immersion) field in at least 3 fields in areas of maximal cellular concentration.
    2. If Gram stain is nondiagnostic or not available, evaluate first-void urine specimen: positive leukocyte esterase (LE) test or microscopic exam of unspun urine showing  $\geq 10$  WBCs per high-power field are consistent with urethritis.

2. Exclude gonorrhea: Gram-stained smear of urethral exudate negative for GNIDs, confirmed later by negative nucleic acid amplification test (NAAT) or culture for *N. gonorrhoeae*
3. Obtain urethral test for *C. trachomatis*

Note: Patients who have symptoms but no signs or laboratory evidence of urethral inflammation should be re-examined when they have not urinated for > 4 hours. Symptoms alone, in the absence of signs or laboratory evidence of urethral inflammation, are not a sufficient basis for treatment (or re-treatment). On the other hand, a urethral Gram-stained smear showing  $\geq 5$  PMNs per 1000X (oil immersion) field on two occasions at least 5 days apart is diagnostic of urethritis, even in the absence of symptoms or other criteria.

### C. Treatment

1. Initial or isolated episode (no episode in previous 6 wks.)

#### Recommended

- a. Azithromycin 1.0 g PO single dose; **OR**
- b. Doxycycline<sup>‡</sup> 100 mg PO bid for 7 days

#### Alternative

- c. Erythromycin base<sup>§</sup> 500 mg PO qid (or enteric coated erythromycin base 666 mg tid) for 7 days; **OR**
- d. Erythromycin ethyl succinate<sup>§</sup> (EES) 800 mg PO qid for 7 days; **OR**
- e. Ofloxacin\* 300 mg PO qid for 7 days; **OR**
- f. Levofloxacin\* 500 mg PO daily for 7 days

2. Symptomatic persistent or recurrent NGU
  - a. Poor compliance or partner not treated: repeat initial regimen; consider adding metronidazole 2 gm PO single dose to cover possible trichomonal infection

<sup>§</sup>In case of severe GI intolerance with erythromycin, give the drug with food, halve the dose, and double the duration of therapy (14 days).

\*Quinolones contraindicated in pregnant or nursing women. Avoid multiple-dose quinolone therapy for adolescents < 18 years of age.

<sup>‡</sup>Doxycycline contraindicated in pregnancy.

- b. Good compliance and partner treated
  - i. Treat with metronidazole 2 gm PO single dose **PLUS** erythromycin or azithromycin as above
  - ii. Consider wet mount exam (and culture, if available) for trichomonas
- c. Recurrence of urethritis after a one week trial of doxycycline followed by a one week trial of erythromycin: use erythromycin 500 mg PO qid (or 666 mg tid) for 3 weeks; or doxycycline 100 mg PO bid for 3 weeks. Multiple or prolonged courses of antibiotics have not been shown to be of clear benefit.
- d. Failure rates are substantially higher for nonchlamydial NGU than for chlamydial infection, regardless of treatment regimen. Advise sexual abstinence until symptoms have resolved and treatment has been completed.

Note: Some men with persistent urethral symptoms may have prostate gland disease, especially if accompanied by perineal or testicular discomfort. However, the diagnosis of chronic prostatitis is difficult, time-consuming, and often unreliable. Such patients usually should be referred to a urologist rather than undergoing digital prostate examination or other work-up in the STD clinic setting.

#### **D. Sex partners**

- 1. Initial or isolated NGU
  - a. Evaluate and treat all partners within past 60 days. Partners should generally be treated empirically with antichlamydial regimens, even though most will test negative for chlamydia.
  - b. Abstain from sexual contact until 7 days after therapy is initiated

2. Recurrent NGU
  - a. The need for and value of treatment are unknown. The approach should be individualized on the basis of available clinical, epidemiologic, and microbiologic data.
  - b. Emphasize abstinence or condom use during treatment.
  - c. Once sex partners have been treated or documented to be free of infection, repeated evaluation and treatment of the partner usually are not indicated.

## IV. MUCOPURULENT CERVICITIS

### A. Clinical picture

Mucopurulent cervicitis (MPC) has been called the female counterpart urethritis in males. It can be caused by infection with *N. gonorrhoeae* or *C. trachomatis*, although most cases test negative for both gonorrhea and chlamydia. The syndrome is characterized by mucopurulent cervical discharge and a cervical inflammatory response (friability, edema, ectopy, increased numbers of polymorphonuclear leukocytes [PMNs]). Persons with increased PMNs on cervical Gram stain alone (cervical leukocytosis), in the absence other observable evidence of cervical inflammation, probably should not be treated empirically since this is a poor predictor of gonococcal or chlamydial infection. Patients with MPC may note vaginal discharge, dyspareunia, post-coital or intermenstrual bleeding, or other non-specific symptoms. Interpretation of the cervical Gram stain has not been standardized, and use of the Gram stain to diagnose MPC has recently come under greater scrutiny (*Obstet Gynecol* 2002; 100:579-84). A retrospective analysis of John C. Murphy clinic data confirms that most women with MPC have  $\geq 15$  PMNs per oil-immersion field.

### B. Diagnosis

1. Document clinical MPC by the presence of criterion (a) below **AND** at least one other criterion (b, c, **or** d):
  - a. Endocervical Gram-stained smear with a monolayer of  $\geq 15$  PMNs per 1000X (oil immersion) field, in a specimen obtained from the endocervix after cleaning the ectocervix with a swab to wipe the cervix free of vaginal epithelial cells or menstrual blood, and in absence of primary herpes, trichomoniasis, or candidiasis
  - b. Purulent endocervical discharge; or positive "swab test" (yellow or green color on endocervical swab)
  - c. Hypertrophic or edematous cervical ectopy
  - d. Endocervical bleeding induced by gentle swabbing
2. Perform tests for gonorrhea and chlamydia
3. Exclude presence of GNIDs on cervical Gram-stained smear

4. Consider other potential causes of cervical inflammation:
  - a. Herpetic cervicitis
  - b. Trichomoniasis
  - c. Candidiasis
  - d. Vaginitis due to a foreign body or chemical irritation
  - e. Presence of IUD, ectopy, oral contraceptives, and menses may be associated with PMNs in endocervical smears
5. In general, treatment is not indicated for patients with cervical leukocytosis ( $\geq 15$  PMNs per oil-immersion field) and no other physical evidence of cervical inflammation. Treat only if test results indicate, unless other epidemiologic risk factors present (e.g. age  $< 20$ , symptomatic partner)

### C. Treatment

CDC recommends basing treatment for MPC upon the results of sensitive gonorrhea and chlamydia tests – in general, treatment may be withheld pending the outcome of these test results. In certain circumstances, it may be appropriate to provide empiric therapy before test results are known, for example, if likelihood of infection is high, or if patient follow-up cannot be assured. In these cases with documented MPC and negative gonococcal Gram stain, the following empiric therapy may be offered:

1. Antichlamydial therapy
  - a. Azithromycin 1.0 g PO single dose; **OR**
  - b. Doxycycline<sup>‡</sup> 100 mg bid for 7 days; **OR**
  - c. Erythromycin base<sup>§</sup> 500 mg PO qid for 7 days; **OR**
  - d. Erythromycin ethyl succinate<sup>§</sup> 800 mg PO qid for 7 days;

**OR**

  - e. Ofloxacin\* 300 mg PO bid for 7 days; **OR**
  - f. Levofloxacin\* 500 mg PO daily for 7 days

<sup>‡</sup>Doxycycline contraindicated in pregnancy.

<sup>§</sup>In case of severe GI intolerance with erythromycin, give the drug with food, halve the dose, and double the duration of therapy (14 days).

\*Quinolones contraindicated in pregnant or nursing women. Avoid multiple-dose quinolone therapy for adolescents  $< 18$  years of age.

2. If gonococcal infection is likely on clinical or epidemiologic grounds, precede treatment with a single-dose gonorrhea regimen

**D. Sex partners**

1. All current sex partners should receive full STD evaluation. While CDC does not specify a contact interval for partner evaluation, it is probably most important to evaluate those partners within the past 30 days of diagnosis or onset of symptoms.
2. If NGU or gonorrhea present: treat accordingly
3. If no urethritis is documented in the partner, it is generally safe to defer treatment pending results of tests for gonorrhea and chlamydia. However, empiric therapy at the time of initial examination may be indicated if follow-up cannot be assured.

# VAGINITIS AND VAGINOSIS SYNDROMES

## I. BACTERIAL VAGINOSIS

### A. Clinical picture

Bacterial vaginosis (BV) is a clinical syndrome characterized by the presence of malodorous vaginal discharge, with or without vaginal pruritus. Usually there is no external genital irritation or dysuria. The discharge is generally a homogeneous, non-viscous, milky white fluid which smoothly coats the vaginal mucosa and cervix. Imbalance of the normal vaginal flora is thought to play a role in the etiology of BV, resulting in overgrowth of *Gardnerella*, anaerobes, or genital mycoplasmas. The absence of hydrogen peroxide-producing *Lactobacillus* in the vagina appears to correlate with development of BV. Presence of “clue cells” (epithelial cells coated with bacteria) is one of four accepted criteria used in making the diagnosis of BV.

### B. Diagnosis

Vaginal secretions characterized by **at least 3 of the following**:

1. Amine ("fishy") odor before or after addition of 10% KOH
2. pH  $\geq$  4.5 (unreliable if blood present)
3. Homogeneous, smooth, noninflammatory discharge
4. Presence of clue cells on microscopic exam

### C. Treatment

#### Recommended

1. Metronidazole 500 mg PO bid for 7 days; **OR**
2. Metronidazole 0.75% gel 5 g intravag. qd for 5 days; **OR**
3. Clindamycin 2% cream 5 g intravag. qhs for 7 days; **OR**

#### Alternative

4. Metronidazole 2 gm PO single dose; **OR**
5. Clindamycin 300 mg PO bid for 7 days; **OR**
6. Clindamycin ovules 100 g intravag. qhs for 3 days

### Pregnancy

7. Metronidazole 250 mg PO tid for 7 days; **OR**
8. Clindamycin 300 mg PO bid for 7 days
  - a. BV linked to adverse pregnancy outcomes (PROM, chorioamnionitis, preterm labor, premature birth, postpartum endometritis, post-cesarian wound infection)
  - b. **Oral metronidazole OK to use at all stages of pregnancy**; multiple studies and meta-analyses demonstrate no teratogenic / mutagenic effects in humans.
  - c. Clindamycin cream is contraindicated in pregnancy: three clinical trials have shown an increase in prematurity and neonatal infections

### Other information

9. Avoid alcohol during treatment with oral metronidazole and for 24 hours thereafter, due to possible disulfiram-type reaction
10. Clindamycin cream is oil-based, may weaken latex condoms
11. Noncompliant patients can be treated with single-dose metronidazole as above, but higher rate of relapse is seen

### **D. Sex partners**

Routine treatment of male partner(s) with metronidazole does not prevent recurrence of bacterial vaginosis. For recurrent BV without evidence of other STD, recommend use of condoms, avoid douching.

## II. TRICHOMONAL VAGINITIS

### A. Clinical picture

Trichomoniasis is a parasitic infection caused by *T. vaginalis*. In women, trichomonal vaginitis is characterized by the development of profuse, purulent, malodorous vaginal discharge (occasionally foamy). Cervical petechiae are commonly seen ("strawberry cervix"). External dysuria and genital irritation are sometimes present. As in BV, the vaginal pH in trichomoniasis is generally  $\geq 4.5$ . *T. vaginalis* is increasingly recognized as a cause of nongonococcal urethritis in males and can occasionally be cultured from male urethral swab or first-void urine samples.

### B. Diagnosis

1. Demonstration of motile trichomonads on saline wet mount of vaginal exudates; **OR**
2. Positive culture of vaginal secretions, urethral secretions, or male first-void urine sample for *T. vaginalis* using Diamond's medium or In-Pouch diagnostic test (not widely available); **OR**
3. PCR test of genital secretions for *T. vaginalis* (not FDA-approved)

### C. Treatment

#### Recommended

1. Metronidazole 2.0 g PO, single dose; **OR**

#### Alternative

2. Metronidazole 500 mg PO bid for 7 days

#### Pregnancy

3. Use metronidazole 2 gm PO single dose regimen
  - a. Trichomonal vaginitis linked to adverse pregnancy outcomes (PROM, premature birth, low birthweight)

- b. Oral metronidazole OK to use at all stages of pregnancy;** multiple studies and meta-analyses demonstrate no teratogenic / mutagenic effects in humans

Other information

4. Advise sexual abstinence until symptoms improve and partner(s) treated
5. Avoid alcohol during treatment with oral metronidazole and for 24 hours thereafter, due to possible disulfiram-type reaction
6. Treatment failure (persistence or recurrence despite sexual abstinence, or after intercourse only with a treated partner): metronidazole 500 mg PO bid for 7 days
7. Repeated treatment failure: metronidazole 2 gm PO qd for 3 to 5 days
8. Metronidazole gel is not effective for treatment of *T. vaginalis*
9. Consider metronidazole resistance if patient is persistently infected after multiple treatment courses; consult CDC for isolate susceptibility testing (770-488-4115)
10. Tinidazole appears effective against metronidazole-resistant *T. vaginalis*, but not yet available in U.S. (*Clin. Inf. Dis.* 2002; 33:1341-6).

**D. Sex partners**

1. Routine STD exam
2. Metronidazole 2.0 g PO, single dose for all partners
3. Abstain from sexual contact until 7 days after therapy is initiated

### III. VULVOVAGINAL CANDIDIASIS

#### A. Clinical picture

Vulvovaginal candidiasis (V V C), commonly termed “yeast infection,” is suggested by the presence of vulvovaginal soreness, dyspareunia, vulvar pruritus, external dysuria, and thick or “cheesy” vaginal discharge. Patients with V V C may develop exudative candidal plaques adherent to the vaginal mucosa, along with erythema or edema of the introitus or vulva. The causative agents are *Candida sp.* yeasts. In contrast to BV and trichomoniasis, the vaginal pH in V V C is generally < 4.5.

#### B. Diagnosis

1. Clinical presentation consistent with V V C
2. Fungal elements (budding yeast or pseudomycelia) are usually but not always identified in the KOH preparation (less often in saline preparation or Gram stain).
3. Treatment for V V C is usually indicated if clinical features are present, even if yeast are not seen
4. Demonstration of yeast buds or positive culture for *Candida*, in the absence of signs or symptoms, may not require therapy since 10-20% of women normally harbor yeast in the vagina
5. Women with repeatedly negative KOH preparations should be referred to women’s health other appropriate specialist for further evaluation.

#### C. Treatment

1. Intravaginal imidazole cream or suppository treatment, such as clotrimazole vaginal cream or suppository 100 mg daily hs for 7 days, or equivalent dosage of other agent (miconazole, terconazole, butoconazole, etc.); **OR**
2. Intravaginal nystatin tablets 100,000 units daily for 14 days; **OR**
3. Fluconazole<sup>§</sup> 150 mg PO, single dose

<sup>§</sup>Avoid use of fluconazole in pregnancy.

4. In general, intravaginal imidazole cream or suppository treatment is tried first, with fluconazole therapy reserved for recurrent infection

**D. Sex partners**

Examination and treatment usually not necessary. However, treatment with an imidazole cream (e.g. miconazole, clotrimazole) may be indicated in some cases of recurrent infection, or if the partner has penile candidiasis (balanitis).

# GENITAL ULCER DISEASE SYNDROMES

## I. SYPHILIS

### A. Clinical picture

Syphilis is a systemic infection caused by *Treponema pallidum*. Primary syphilis is characterized by one or more painless, superficial ulcerations (chancres) at the site of exposure. Such lesions may be seen at any site in the genital, anorectal, or oropharyngeal tracts; thus a high index of provider suspicion is required when any patient presents with a mucosal ulcer or “sore.” The chancre often has raised, sharply demarcated borders, a red smooth base, and scant serous secretion, although the clinical presentation is quite variable. Regional lymphadenopathy may also be present. Average time from infectious exposure to lesion development is 3 weeks (range 9-90 days). Resolution of lesions generally occurs 3-6 weeks thereafter without treatment.

Secondary syphilis may develop following resolution of primary lesions. Secondary disease is characterized by macular, maculopapular, or papular skin lesions (“rash”), typically involving palms, soles, and flexor areas of the extremities. The trunk, back, shoulders, abdomen, and face are also commonly involved, and mucous patches may develop. Pustular lesions and condylomata lata may infrequently occur. Average time from infectious exposure to onset of secondary symptoms is 6 weeks.

Latent syphilis is diagnosed serologically in the absence of primary or secondary symptoms. Early disease ( $\leq 1$  year) is differentiated from late disease ( $> 1$  year) for treatment purposes (see below). **If recent infection cannot be documented (e.g. negative serology within the past year, or epidemiological contact to a known recent case), patients should be assumed to have late latent disease and treated accordingly.**

Tertiary syphilis is rare, but may manifest as mucocutaneous / osseous lesions (gummas), cardiovascular lesions (aortitis), or neurologic involvement (neurosyphilis). While neurosyphilis is generally a late complication of infection, syphilitic meningitis may occur as an early complication within the first few weeks of infection, or at any time thereafter.

Nationally, syphilis rates fell from 1990-2000 but increased in 2001, driven primarily by outbreaks of syphilis among men who have sex with men (MSM) in cities on the East and West coast. In 2001, the City of St. Louis reported 15 cases of primary and secondary syphilis, giving it the 23<sup>rd</sup> highest *per capita* rate of infection among large US cities (4.3 cases per 100,000 pop.).

## B. Diagnosis

1. Darkfield microscopy of genital lesion exudate: specific but insensitive
2. Non-treponemal serologic test: RPR (Rapid Plasma Reagin) **or** VDRL (Venereal Disease Research Laboratory)
  - a. Often reactive within 1 - 2 weeks of chancre onset
  - b. 15 - 30 % of patients with primary syphilis may have **negative** RPR at time of initial exam
  - c. False-positive in variety of conditions (e.g. lupus, pregnancy, etc.)
  - d. False-negative prozone effect in 1-2% of secondary syphilis; serum is reactive with serial dilutions
  - e. RPR generally runs approximately 1 titer higher than VDRL; both tests are only accurate to within  $\pm$  1 dilution
3. Treponemal serologic test to confirm infection: FTA-ABS (fluorescent treponemal antibody absorption) **or** TP-PA (*T. pallidum* particle agglutination)
4. Direct fluorescent antibody (DFA) examination of lesion exudates not widely available

## C. Treatment

1. Early syphilis: primary, secondary, early latent ( $\leq$  1 yr duration)  
Recommended
  - a. Benzathine PCN G 2.4 million units IM single dose  
Alternative
  - b. Doxycycline<sup>‡</sup> 100 mg PO bid for 14 days; **OR**
  - c. Tetracycline<sup>‡</sup> 500 mg PO qid for 14 days; **OR**

<sup>‡</sup>Doxycycline and tetracycline contraindicated in pregnancy.

- d. Erythromycin 500 mg PO qid for 14 days (less effective); **OR**
- e. Ceftriaxone 250 mg IM daily for 8-10 days (less effective); **OR**
- f. Azithromycin 2.0 g PO, single dose – appears effective in preliminary data, close follow-up after treatment essential

Children

- g. Benzathine PCN G 50,000 units / kg IM (up to the adult dose of 2.4 million units) single dose
  - i. Need CSF examination
  - ii. Determine if congenital or acquired – consult pediatrician

2. Late syphilis (> 1 yr duration --except neurosyphilis)

Recommended

- a. Benzathine PCN G 2.4 million units IM q week for 3 weeks

Alternative

- b. Tetracycline<sup>‡</sup> 500 mg PO qid for 28 days; **OR**
- c. Doxycycline<sup>‡</sup> 100 mg PO bid for 28 days

Children

- d. Benzathine PCN G 50,000 units / kg IM (up to the adult dose of 2.4 million units) q week for 3 weeks (total 150,000 units / kg up to max 7.2 million units)
  - i. Need CSF examination
  - ii. Determine if congenital or acquired – consult pediatrician

<sup>‡</sup>Doxycycline and tetracycline contraindicated in pregnancy.

### 3. Neurosyphilis

#### Recommended

- a. Aqueous crystalline PCN G 18-24 million units daily IV (3-4 million units q 4 hrs, or continuous infusion) for 10 - 14 days, followed by a single dose of benzathine PCN G 2.4 million units IM at the completion of IV therapy

#### Alternative

- b. Procaine PCN 2.4 million units IM daily **PLUS** probenecid 500 mg PO qid, both for 10 - 14 days, followed by a single dose of benzathine PCN G 2.4 million units IM at the completion of IM therapy
  - c. Ceftriaxone 2 g IV or IM daily for 10 – 14 days also appears safe and effective. Follow treatment with single dose of benzathine PCN G 2.4 million units IM at completion of therapy.
- ### 4. Jarisch-Herxheimer reaction
- a. Systemic manifestations of treponeme lysis – fever, malaise, headache, musculoskeletal pain, nausea, tachycardia
  - b. May occur 4-8 hrs. after treatment, resolves in 24 hrs.
  - c. More common following treatment of early syphilis
  - d. Self-limited: treat with fluids, acetaminophen, ibuprofen
- ### 5. Syphilis in pregnancy
- a. **Pregnant women with syphilis must be treated with penicillin, since no other medication effectively crosses the placenta to treat the fetus**
  - b. If allergic to penicillin, must refer to allergist for desensitization and treatment with penicillin – regimen provided in CDC Treatment Guidelines [MMWR 2002; 51(RR-6):28-30]

**Note: For all stages of syphilis, penicillin is the treatment of choice.** If doxycycline or any other antibiotic is given, stress adherence to the regimen since deletion of only a few doses significantly increases the failure rate.

#### D. Sex partners

Refer all patients with syphilis to disease intervention specialist (DIS) for immediate counseling and interview. All partners with potential exposure must be referred for clinical evaluation. Notify DIS staff **before** examining and treating contacts to discuss contact history and appropriate management. In general, the following guidelines apply:

1. Partners of patients with early syphilis ( $\leq 1$  yr duration)
  - a. Routine history, examination, and serologies (syphilis, HIV)
  - b. Routine epidemiologic treatment for **all partners within the preceding 90 days**, regardless of serologic test result
  - c. Treat partners  $> 90$  days if test results not immediately available or follow-up cannot be assured
  - d. For purposes of partner notification and presumptive treatment of contacts, patients with high RPR or VDRL titers ( $\geq 1:32$ ) are assumed to have early syphilis, and partners are treated presumptively. (However, titer should not be used to differentiate early vs. late syphilis for purposes of determining treatment regimen.)
2. Partners of patients with late syphilis ( $> 1$  yr duration)
  - a. Routine history, examination, and serologies (syphilis, HIV)
  - b. Obtain specific treponemal test (FTA-ABS or TP-PA), even if RPR negative, for spouses, other long-term partners, or children of infected women and treat accordingly

#### E. Other management issues

1. Follow-up after treatment
  - a. Early syphilis
    - i. Clinical examination and repeat serology at 6 and 12 months, or sooner if clinically indicated
    - a. RPR should show a 4-fold titer decrease within 6 months of treatment

- b. Use same test at each visit to facilitate interpretations, since RPR titers are often slightly higher than VDRL
  - ii. Consider treatment failure vs. reinfection if signs or symptoms persist or recur, or if nontreponemal titer increases 4-fold – LP generally indicated before retreatment unless reinfection is certain
  - iii. If HIV-negative (or if not tested), advise repeat HIV testing at 3-6 months
- b. Late syphilis
  - i. Repeat serology in 6, 12, 24 months
  - ii. Evaluate for neurosyphilis if:
    - a. nontreponemal titer increases 4-fold
    - b. initially high titer ( $\geq 1:32$ ) fails to fall 4-fold in 12-24 months
    - c. signs or symptoms of syphilis develop
- c. Neurosyphilis
  - i. Repeat serology in 3, 6, 12, 24 months
  - ii. Follow-up lumbar puncture (LP) at 6-month intervals until cell count is normal
  - iii. Consider retreatment if cell count not decreased at 6 months or CSF not entirely normal at 2 years
- d. Syphilis (any stage) in HIV-positive patients
  - i. Clinical examination in 1 week
  - ii. Repeat serology in 3, 6, 9, 12, 24 months, then yearly (even if RPR seroreverts)

2. Indications for lumbar puncture (LP) in latent syphilis\*
  - a. Neurologic or ophthalmic signs/symptoms
  - b. Evidence of tertiary disease (gumma, aortitis, iritis)
  - c. Treatment failure
  - d. HIV infection with late latent or unknown duration syphilis
    - i. HIV+ early latent syphilis does not need routine LP unless clinically indicated
    - ii. Close follow-up required, since up to 25% of HIV+ patients may develop neurosyphilis despite adequate therapy
  
3. Pregnancy
  - a. All women should be screened serologically at first prenatal visit
  - b. Treat with the penicillin regimen appropriate for the stage of disease
  - c. Some experts give **one additional dose** of benzathine PCN IM one week after the initial dose for patients with early syphilis during pregnancy
  - d. Advise patients treated in second half of pregnancy about Jarisch-Herxheimer reaction, which can precipitate premature labor, fetal distress
  - e. Reminder: true penicillin allergy in pregnant woman requires skin testing and desensitization, since alternative medications do not treat the fetus

\*Common exceptions to LP include:

- asymptomatic elderly patients with late latent syphilis, RPR  $\leq$  1:4
- patients with RPR  $\leq$  1:2 for whom probable duration since primary infection is  $\geq$  30 years
- immigrants from geographic areas with high prevalence of pinta or yaws (e.g. tropical Americas, Southeast Asia, central Africa) who have no history of prior syphilis and RPR  $\leq$  1:4

## II. GENITAL HERPES

### A. Clinical picture

Genital herpes is caused by infection with herpes simplex virus (HSV), types 1 and 2. Infection is typically characterized by the development of painful grouped vesicles in the anogenital region. The lesions evolve over several days into shallow ulcerations, which generally heal within 1 - 2 weeks. While both HSV-1 and HSV-2 can be sexually transmitted, most genital herpes infections are caused by HSV-2 (however, reports of primary genital HSV-1 infections are increasing). **Virtually any genital ulcer may be herpetic, regardless of clinical characteristics.** Virologic typing can be important for rendering prognosis, since HSV-1 is less likely to recur than HSV-2. Serologic studies suggest that 45 million persons in US have been infected with HSV-2. Asymptomatic transmission is thought to account for a significant share of disease. Newly-available type-specific serologic tests can reliably detect antibody to HSV and will likely play an increasing role in clinical management.

### B. Diagnosis

1. Physical findings
  - a. Initial / primary episodes
    - i. Grouped, tender vesicular or pustular lesions on erythematous base
    - ii. Lymphadenopathy, fever, headache, myalgias, or herpetic urethritis or cervicitis are variably present
  - b. Recurrent episodes
    - i. Grouped, tender superficial ulcerations in a dermatomal distribution; patient may or may not note a history of recurrence
    - ii. Recurrences usually cause fewer lesions and are less frequently accompanied by lymphadenopathy, systemic symptoms, urethritis, or cervicitis
  - c. Most patients with genital HSV infection are asymptomatic, or have mild or nonspecific symptoms

2. Laboratory
  - a. HSV culture
    - i. Routine culture testing is recommended for first-episode of typical herpes lesions, for all atypical lesions, and for all genital ulcers which are otherwise undiagnosed
    - ii. Culture testing is optional if classical vesicular or pustular lesions present, especially recurrent lesions
  - b. HSV antigen detection (IF): not widely available
  - c. Cytologic diagnosis by Tzanck preparation: not currently recommended for routine examination of lesions in STD clinic -- specific but insensitive, also does not distinguish between HSV and VZV infection
  - d. Type-specific HSV serology: not yet widely available
  - e. Perform *stat* RPR and darkfield examination for **all** genital ulcers not typical for HSV (e.g. nontender, solitary ulcers); consider chancroid culture

### C. Treatment

1. First clinical episode (primary or initial infection)

#### Recommended

- a. Acyclovir 400 mg PO tid for 7-10 days; **OR**
- b. Acyclovir 200 mg PO 5 times daily for 7-10 days; **OR**
- c. Famciclovir 250 mg PO tid for 7-10 days; **OR**
- d. Valacyclovir 1.0 g PO bid for 7-10 days
  
- e. When possible, start therapy within 2 days of onset of symptoms, but may be effective up to 1 week after onset
- f. Local care: keep affected area clean and dry
- g. **There is no medically proven role for topical acyclovir – its use is discouraged**

2. Episodic treatment of recurrent episodes -- therapy should be initiated during prodrome or immediately after onset of symptoms

Recommended

- a. Acyclovir 400 mg PO tid for 5 days; **OR**
  - b. Acyclovir 200 mg PO 5 times daily for 5 days; **OR**
  - c. Acyclovir 800 mg PO bid for 5 days; **OR**
  - d. Famciclovir 125 mg PO bid for 5 days; **OR**
  - e. Valacyclovir 500 mg PO bid for 3 - 5 days; **OR**
  - f. Valacyclovir 1.0 g PO daily for 5 days
  
  - g. Local care: keep affected area clean and dry
  - h. **There is no medically proven role for topical acyclovir – its use is discouraged**
  - i. Patients with severe or frequent recurrences may be candidates for suppressive treatment, or for self-initiation of episodic treatment. Potential candidates for self-initiated or chronic suppressive therapy should have the diagnosis documented by culture before starting treatment.
3. Suppressive therapy -- recommended for patients with 6 recurrences or more per year

Recommended

- a. Acyclovir 400 mg PO bid; **OR**
- b. Famciclovir 250 mg PO bid; **OR**
- c. Valacyclovir 500 mg PO daily; **OR**
- d. Valacyclovir 1.0 g PO daily
  
- e. Treat for up to one year, at which point need for continued suppressive therapy should be reassessed
- f. Counsel patients that treatment reduces the frequency of recurrences, but that mild episodes may continue to occur and that the patient may remain infectious

4. Initial or primary HSV infection in pregnancy
  - a. Acyclovir is probably safe, may be indicated (Appendix I)
  - b. Discuss with women’s health consultant or other expert before prescribing any medication
  - c. Highest risk for neonatal herpes is maternal acquisition in late pregnancy – pregnant women should be counseled accordingly
5. Symptomatic herpes in HIV-infected persons
  - a. Episodic therapy regimens
    - i. Acyclovir 400 mg PO tid for 5 – 10 days; **OR**
    - ii. Acyclovir 200 mg PO 5 times daily for 5 – 10 days; **OR**
    - iii. Famciclovir 500 mg PO bid for 5 – 10 days; **OR**
    - iv. Valacyclovir 1.0 g PO bid for 5 – 10 days
  - b. Suppressive therapy regimens
    - i. Acyclovir 400 – 800 mg PO bid – tid; **OR**
    - ii. Famciclovir 500 mg PO bid; **OR**
    - iii. Valacyclovir 500 mg PO bid
  - c. High-dose valacyclovir was linked to HUS-TTP-like reaction in small number of HIV+ patients, but now appears safe at recommended dosages
6. Counseling
  - a. Sexual abstinence until all lesions have healed.
  - b. For initial herpes, recommend use of condoms for all intercourse with uninfected partners for the next 6-12 months
  - c. Inform patients that although they are at greatest risk for transmitting virus during outbreaks, sexual transmission of HSV can occur during asymptomatic periods due to viral shedding

#### **D. Sex partners**

Routine STD evaluation recommended for all partners. Educate partners about signs and symptoms and advise examination and HSV culture if symptoms occur. Consider referral for type-specific serologic testing to determine if infection has occurred, and counsel accordingly.

### III. CHANCROID

#### A. Clinical picture

Chancroid is caused by infection with *Haemophilus ducreyi*. Symptoms include painful, non-indurated, excavated genital ulcers with undermined borders. Tender enlarged inguinal lymph nodes are often seen; these may suppurate, and pus containing infectious material may be aspirated from the resultant buboes. Since chancroid is rare outside of endemic areas, a history of recent sexual exposure in an endemic area may raise the provider's index of suspicion. Only 38 cases of chancroid were reported in the U.S. in 2001. Current techniques for culture of *H. ducreyi* are only 50-75% sensitive.

#### B. Diagnosis

1. Physical findings
  - a. Usually 1 to 3 tender, non-indurated genital ulcers with purulent bases
  - b. Inguinal lymphadenopathy often (but not always) present
  - c. Fever and other systemic symptoms are generally absent
2. Laboratory
  - a. Culture of *H. ducreyi* from lesion or lymph node aspirate provides **definitive** diagnosis of *H. ducreyi* infection
    - i. Culture techniques require special media which may not be available in all clinical sites
    - ii. Culture insensitive even when properly performed
  - b. Gram-stained smear of lymph node aspirate showing typical small Gram-negative bacilli is provides **presumptive** diagnosis of *H. ducreyi* infection
  - c. Gram stain of lesion exudate or swab may be misleading and is **not** recommended
  - d. Obtain tests for HSV and syphilis, including *stat* RPR and darkfield exam
  - e. Strongly recommend testing for HIV

### **C. Treatment**

#### Recommended

1. Azithromycin 1.0 g PO, single dose; **OR**
2. Ceftriaxone 250 mg IM, single dose, **OR**
3. Ciprofloxacin\* 500 mg PO bid for 3 days; **OR**
4. Erythromycin base 500 mg PO tid for 7 days

Note: Patient should be re-examined in 2 - 3 days, then weekly until healed. Repeat RPR and HIV serology (if HIV-negative or not tested at time of diagnosis) in 3 - 6 months.

### **D. Sex partners**

Refer all patients with syphilis to disease intervention specialist (DIS) for immediate counseling and interview. Recommend routine STD examination for all partners within one month prior to onset. Treat all partners exposed within 10 days preceding onset of symptoms in the patient. Encourage HIV testing in all partners

\*Quinolones contraindicated in pregnant or nursing women. Avoid multiple-dose quinolone therapy for adolescents < 18 years of age.

## IV. LYMPHOGRANULOMA VENEREUM

### A. Clinical picture

Lymphogranuloma venereum (LGV) is caused by genital infection with *C. trachomatis* serovars L<sub>1</sub>, L<sub>2</sub>, or L<sub>3</sub>. It is most commonly characterized by unilateral tender inguinal lymphadenopathy, with or without evidence of nongonococcal urethritis or a transient genital ulceration. Over time, impaired lymphatic flow may occur in the genital tract, leading to genital elephantiasis, stricture, or fistulous tracts.

### B. Diagnosis

1. Physical findings
  - a. Inguinal lymphadenopathy, tender, unilateral (or bilateral)
  - b. Urethritis or minor genital ulceration may or may not be present
  - c. Acute proctocolitis due to LGV may occasionally be seen
2. Laboratory
  - a. Isolation of an LGV strain of *C. trachomatis* from urethra, cervix, rectum, or lymph node aspirates
  - b. Type-specific chlamydial serology may be diagnostic on a single specimen, but acute and convalescent specimens preferred.

### C. Treatment

#### Recommended

1. Doxycycline<sup>‡</sup> 100 mg PO bid for 3 weeks; **OR**

#### Alternative

2. Erythromycin base 500 mg PO qid for 3 weeks
3. Azithromycin in multiple doses over 2-3 weeks may be effective, but clinical data are lacking.

### D. Sex partners

Recommend routine STD examination plus chlamydia cultures and serology for all partners within 2 months. Treat all partners who had sexual contact with the patient during the 30 days prior to the onset of symptoms.

<sup>‡</sup>Doxycycline contraindicated in pregnancy.

## V. GRANULOMA INGUINALE (DONOVANOSIS)

### A. Clinical picture

Granuloma inguinale is rare in the United States. It is a progressive ulcerative condition caused by the intracellular Gram-negative bacterium *Calymmatobacterium granulomatis*. The disease is endemic in parts of the developing world, including India, Papua New Guinea, southern Africa and central Australia. Lesions present as painless, beefy-red ulcerative lesions in the genital tract, without lymphadenopathy. The lesions are highly vascular and bleed easily on contact.

### B. Diagnosis

1. Physical findings
  - a. Classic beefy-red, painless genital ulcers which progress over weeks to months
  - b. Absence of regional lymphadenopathy (although ulcerations may occur over the inguinal region, mimicking lymph node involvement)
2. Laboratory
  - a. Tissue crush preparation or biopsy showing classic bipolar-staining Donovan bodies
  - b. Organism cannot be grown in standard culture media

### C. Treatment

#### Recommended

1. Doxycycline<sup>‡</sup> 100 mg PO bid for minimum of 3 weeks; **OR**
2. Trimethoprim-sulfamethoxazole<sup>§</sup> 1 double-strength tablet PO bid for minimum of 3 weeks;

#### Alternative

3. Ciprofloxacin\* 750 mg PO bid for minimum of 3 weeks; **OR**
4. Erythromycin base 500 mg PO qid for minimum of 3 weeks; **OR**
5. Azithromycin 1.0 g PO weekly for minimum of 3 weeks

<sup>§</sup>Avoid trimethoprim-sulfamethoxazole in 3<sup>rd</sup> trimester of pregnancy.

<sup>‡</sup>Doxycycline contraindicated in pregnancy.

\*Quinolones contraindicated in pregnant or nursing women. Avoid multiple-dose quinolone therapy for adolescents < 18 years of age.

6. Continue therapy until all lesions have healed completely
7. Add aminoglycoside (e.g. gentamicin) if lesions do not respond within the first few days of oral therapy

#### **D. Sex partners**

Recommend routine STD examination and treatment for all partners who have had sexual contact within past 60 days and have clinical signs and symptoms of disease.

# EXOPHYTIC PROCESSES

## I. EXTERNAL GENITAL WARTS (*Condylomata acuminata*)

### A. Clinical picture

Warts are caused by infection with human papillomavirus (HPV). Most exophytic warts are due to HPV types 6 and 11. Certain other HPV types, especially types 16 and 18 (high-risk) and 31, 33, and 35 (intermediate risk), have been epidemiologically linked to the development of cervical cancer in women.

### B. Diagnosis

Visual inspection reveals typical "cauliflower" lesions, usually involving the external genitalia, perineum, or perianal area. Differential diagnosis includes molluscum contagiosum or condyloma lata (secondary syphilis manifestation). Warts may be solitary or clustered. Application of a weak acetic acid solution (3-5%) is occasionally used to highlight exophytic warts on the skin surface -- affected areas will turn white as the solution dries. (Note: Do not apply acetic acid to mucus membrane areas). A vaginal speculum examination should be done at the initial presentation of all women with anogenital warts to evaluate for any visible cervical lesions. Similarly, anoscopy to detect warts of the rectal mucosa should be done at the initial visit for all patients (men and women) with anal or perianal warts. Condylomata of the cervix may be documented by colposcopy or cervical cytology, so a Pap smear should be recommended for all women newly diagnosed with warts regardless of when previous cytology was performed.

### C. Treatment

Appropriate therapy can be either provider-applied or patient-applied, depending upon clinical circumstances and patient preferences. Patient-applied therapies are more convenient but require compliance and motivation.

### Provider-applied

1. Liquid nitrogen (LN<sub>2</sub>) or cryoprobe
  - a. Treat visible warts, freezing each lesion 10-15 seconds
  - b. Allowing lesions to thaw, then repeat application
  - c. At least 2 or 3 treatments are usually required (weekly or every other week)
  - d. Patients presenting for follow-up treatment within 4 weeks of initial visit are **not** required to undergo full STD screening if they have not had sex in the interim period
2. Podophyllin\* resin 10-25% in tincture of benzoin
  - a. Apply once or twice weekly until warts resolve
  - b. Podophyllin should be washed off 1-4 hours after the first application – if there is no unusual pain or inflammation, each subsequent application may remain for 4 - 8 hours or, with a physician's approval, for up to 24 hours
  - c. Max. use 0.5 cc per application, max. coverage 10 cm<sup>2</sup>
3. Trichloroacetic (TCA) or bichloroacetic acid (BCA) 70 - 90%
  - a. Apply to warts, avoid application to surrounding skin
  - b. Powder with talc to remove unreacted acid
  - c. Repeat weekly if necessary up to six times
4. Surgical removal
  - a. Extensive warts, cervical condylomata, and warts not responding to the above measures over 3-4 weeks
  - b. Modalities include tangential scissor excision, tangential shave excision, curettage, electrosurgery
5. Mucosal warts (except scant vaginal lesions and small, easily accessible, meatal warts): Refer to an appropriate specialist; if meatal warts present, a urological evaluation may be indicated to assess the urethra for additional lesions
6. Interferon therapy and laser surgery are generally considered too expensive for routine use in public health settings

\*Podophyllin contraindicated in pregnancy.

### Patient-applied

7. Podofilox\* 0.5% solution or gel
  - a. Apply with cotton swab twice daily for 3 days, followed by 4 days of no therapy
  - b. Cycle may be repeated as necessary up to a total of 4 cycles
  - c. Max. use 0.5 cc per day, max. coverage 10 sq. cm.
8. Imiquimod\* 5% cream
  - a. Apply with fingertip at bedtime 3 times per week
  - b. Wash treatment area with mild soap and water 6-10 hrs. after application
  - c. Duration of therapy up to 16 weeks, although warts may resolve within 8-10 weeks or sooner
9. Advise patients that despite resolution of visible warts, cure of HPV infection cannot be assured and that warts may reappear. Discuss use of condoms and recommend annual Pap smears for women.

### **D. Sex partners**

Routine STD examination is recommended for all partners, including cervical cytology for female partners of infected men. Discuss likelihood of subclinical infection in males and females alike.

\*Podofilox and imiquimod contraindicated in pregnancy.

## II. MOLLUSCUM CONTAGIOSUM

### A. Clinical picture

Molluscum contagiosum is a benign papular condition caused by the molluscum contagiosum virus (MCV). It is often sexually transmitted in adults, but may be spread through non-sexual routes. It is characterized by the presence of typical firm, small (1-5 mm), fleshy papules, which are often umbilicated. A firm white "pearl" is often expressed on compression, followed by brisk bleeding. Extensive or refractory lesions, or the development of lesions in atypical locations (e.g. face) may be seen in HIV disease.

### B. Diagnosis

Diagnosis of molluscum contagiosum is based on clinical appearance of the lesions. Ability to express a lesion "pearl" is helpful.

### C. Treatment

1. Mechanical
  - a. Unroof lesions with a needle
  - b. Express central core material
2. Liquid nitrogen therapy (LN<sub>2</sub>)
  - a. Effective for small to moderate sized lesions
  - b. Freeze each lesion, allowing to thaw, and refreeze
  - c. One treatment is generally sufficient; retreat as needed
3. Trichloroacetic acid (TCA) 70 - 90 %
  - a. Alternative to LN<sub>2</sub>
  - b. Apply to lesions, avoid application to surrounding skin
  - c. One treatment is generally sufficient; retreat as needed

### D. Sex partners

Routine STD evaluation recommended.

# ECTOPARASITIC INFESTATIONS

## I. PEDICULOSIS PUBIS (Pubic lice, “crabs”)

### A. Clinical picture

Pediculosis pubis is an ectoparasitic infestation caused by *Phthirus pubis*, the crab louse. Transmission is generally via intimate contact with an infected person, although exposure to infected bed linens or clothes may transmit the organism. Patients with pediculosis present with itching in the pubic area, often associated with erythema, irritation, and inflammation. Mobile crab-like organisms may be visible on pubic skin or hair. Lice eggs, or nits, may also be visible on hair shafts.

### B. Diagnosis

Typical *Phthirus pubis* organisms or their nits observed in pubic hair secures the diagnosis. Pubic lice may be perceived as small “scabs” or crusts which, when removed for microscopic examination, begin to walk away before the cover glass is in place. Occasionally the thighs, trunk, eyelashes, or eyebrows are involved.

### C. Treatment

#### Recommended

1. Application of topical antiparasitic medication
  - a. Permethrin 1% creme rinse, applied for 10 minutes then washed off; **OR**
  - b. Lindane\* 1% shampoo, applied for 4 minutes then washed off; **OR**
  - c. Lotion of pyrethrins with piperonyl butoxide, applied for 10 minutes then washed off
2. Treat all skin between the chest and thighs, including axillae
3. Launder all clothes, sheets, blankets in hot water

### D. Sex partners

Routine STD evaluation is recommended. Epidemiologic treatment is generally warranted for sex partners within the preceding month.

\*Lindane contraindicated for pregnant or lactating women or children < 2 years of age.

## II. SCABIES

### A. Clinical picture

Scabies is caused by infestation with the itch mite, *Sarcoptes scabiei*. Transmission is person-to-person via sexual and nonsexual direct contact. Primary clinical manifestations are nocturnal itching, associated with the development of papular or excoriated erythematous skin lesions located in the finger webs, wrists, elbows, axillary folds, trunk (especially at the belt line), buttocks and inguinal areas, penis, scrotum, and labia majora. Lesions are occasionally serpiginous, reflective of mite burrowing beneath the skin. Lesions are almost never found on the back, face or scalp.

### B. Diagnosis

1. Microscopic
  - a. Excoriate lesion with edge of glass microscope slide
  - b. Transfer papular contents to a clean microscope slide
  - c. Apply drop of oil (or KOH) and a coverslip for microscopic examination at 10X or 40X magnification
  - d. Visualization of scabies mite, eggs or feces confirms diagnosis
2. Clinical
  - a. Observe for typical clinical signs and symptoms of scabies infection, including distribution and appearance of papules and possible history of exposure
  - b. If history and physical examination are consistent with scabies, treatment usually is indicated even in the absence of microscopic confirmation

### **C. Treatment**

1. Topical antiparasitic medication or oral therapy

#### Recommended

- a. Permethrin cream 5%, applied to all areas of the body from the neck down for 8-14 hrs. then washed off

#### Alternative

- b. Lindane\* 1% 1 oz. of lotion or 30 gm of cream applied thinly to all areas of body from the neck down for 8 hrs. then washed off (not recommended for pregnant or lactating women, children < 2 yrs, or persons with extensive dermatitis. Not to be used following a bath.)
  - c. Ivermectin<sup>‡</sup> 200 mcg/kg PO single dose, repeat in 2 weeks
2. Launder all clothes, sheets, blankets in hot water
  3. Consider a second application of permethrin or lindane after 4-5 days for particularly heavy infestations

### **D. Sex partners**

Routine STD evaluation is recommended. Treat all regular sexual partners and other household members who have had direct contact with the infected patient.

\*Lindane contraindicated for pregnant or lactating women or children < 2 years of age.

<sup>‡</sup>Ivermectin contraindicated in pregnancy.

# SYSTEMIC STD SYNDROMES

## I. PELVIC INFLAMMATORY DISEASE

### A. Clinical picture

Pelvic inflammatory disease (PID) is a clinical syndrome of upper genital tract infection characterized by pelvic pain, tenderness, and systemic signs and symptoms of infection. Epidemiologic and laparoscopic studies implicate gonorrhea and chlamydia as the most common causes, although anaerobes and other infectious agents have also been identified. Women with acute PID classically present with pelvic pain and cervical motion tenderness; in severe cases, tubo-ovarian abscess or perihepatitis may also be present. The differential diagnosis includes appendicitis, cholecystitis, ectopic pregnancy, or other causes of abdominal pain. While many patients with PID respond to outpatient therapy, some will require hospitalization for intravenous fluids, antibiotics, and observation (see criteria for hospitalization below). All patients for whom hospitalization is considered should be referred to a physician for immediate evaluation. Treatment regimens emphasize coverage for *N. gonorrhoeae* and *C. trachomatis*; as well, many experts are increasingly concerned about the role of anaerobes in PID pathogenesis.

### B. Diagnosis

1. History
  - a. Lower abdominal / pelvic pain
  - b. Dyspareunia
  - c. Vaginal discharge
  - d. Disrupted menstrual pattern (meno- or metrorrhagia)
  - e. Fever
  - f. Nausea / vomiting
2. Physical Examination
  - a. Minimum criteria for diagnosis
    - i. Uterine / adnexal tenderness, or
    - ii. Cervical motion tenderness
  - b. Additional criteria (variably present, increase specificity of diagnosis)

- i. Oral temperature  $>38.3^{\circ}$  C
    - ii. Abnormal cervical or vaginal discharge
    - iii. Presence of WBCs on saline wet mount of vaginal secretions
    - iv. Increased sedimentation rate or C-reactive protein
    - v. Positive test for *N. gonorrhoeae* or *C. trachomatis*
  - c. Most specific criteria
    - i. Endometrial biopsy showing endometritis
    - ii. Transvaginal ultrasound or MRI showing thickened, fluid-filled fallopian tubes, with or without free pelvic fluid or tubo-ovarian complex
    - iii. Laparoscopic findings consistent with PID
- 3. Laboratory
  - a. Gram-stained endocervical smear
    - i. Presence of many PMNs per 1000X (oil immersion) field, coupled with history and physical examination, is consistent with diagnosis of PID
    - ii. Presence of GNIDs suggests gonococcal PID, but absence of GNIDs is **not** predictive of etiology
    - iii. Few or no PMNs suggests diagnosis other than PID (e.g. tubal pregnancy, ovarian cyst, appendicitis)
  - b. Endocervical test for *N. gonorrhoeae* and *C. trachomatis* (nucleic acid amplification test [NAAT] or culture)
  - c. Rectal culture for *N. gonorrhoeae*
  - d. If menses late or if patient is not using reliable contraception: check pulse and blood pressure (supine and seated); obtain sensitive pregnancy test, refer to women's health or other appropriate provider for follow-up

## C. Treatment

1. Inpatient
  - a. Suggested criteria for hospitalization (CDC Guidelines)
    - i. Surgical emergency cannot be excluded (e.g. appendicitis)
    - ii. Patient is pregnant
    - iii. Failure to respond clinically to oral therapy
    - iv. Unable to follow or tolerate outpatient treatment
    - v. Severe illness, nausea, vomiting, high fever
    - vi. Tubo-ovarian abscess
  - b. Parenteral regimens
    - i. [Cefotetan 2.0 g IV q12h **OR** cefoxitin 2.0 g IV q6h] **PLUS** doxycycline<sup>‡</sup> 100 mg PO or IV q12 h
    - ii. Clindamycin 900 mg IV q8h **PLUS** gentamicin<sup>‡</sup> 2 mg/kg loading dose IV or IM followed by 1.5 mg/kg qh8 (or may use single-daily dose of gentamicin 5 mg/kg/d)
    - iii. Alternative parenteral regimens
      - a. [Ofloxacin\* 400 mg IV q12h **OR** levofloxacin\* 500 mg IV daily] **WITH OR WITHOUT** metronidazole 500 mg IV q8h
      - b. Ampicillin/sulbactam 3.0 g IV q6h **PLUS** doxycycline<sup>‡</sup> 100 mg PO or IV q12 h
2. Outpatient
  - a. Oral regimens
    - i. [Ofloxacin\* 400 mg PO bid **OR** levofloxacin\* 500 mg PO daily] for 14 days **WITH OR WITHOUT** metronidazole 500 mg PO bid for 14 days
    - ii. [Ceftriaxone 250 mg IM single dose **plus** doxycycline<sup>‡</sup> 100 mg PO bid for 14 days] **WITH OR WITHOUT** metronidazole 500 mg PO bid for 14 days

\*Quinolones contraindicated in pregnant or nursing women. Avoid multiple-dose quinolone therapy for adolescents < 18 years of age.

<sup>‡</sup>Doxycycline and gentamicin contraindicated in pregnancy.

- iii. [Cefoxitin plus probenecid] or another third-generation cephalosporin may be substituted for ceftriaxone in above regimen, although they are less convenient and generally will not be required
- iv. Data are lacking for other alternative oral regimens (amoxicillin/clavulanic acid plus doxycycline; azithromycin)
- b. Remove IUD, if present
- c. Bed rest recommended for 1-3 days or until pain is significantly improved
- d. Abstain from sexual intercourse for 2 weeks or until symptoms resolved
- e. **Follow-up re-examination within 72 hrs is essential** to ensure adequate response to therapy. Schedule 72 hr. appointment with women's health or other appropriate provider. Patients should also be re-examined 1-2 weeks after completion of all medication.

#### **D. Sex partners**

All partners within the past 3 months should receive full STD evaluation, including urethral smear and tests for gonorrhea and chlamydia, regardless of symptoms. Epidemiologic treatment for gonorrhea and chlamydial infection is appropriate in most cases.

## II. SEXUALLY TRANSMITTED HEPATITIS

### A. Clinical picture

Hepatitis A, B, and C are forms of viral hepatitis which can be sexually transmitted. Hepatitis A is most commonly a food-borne pathogen, transmitted through the oral-fecal route, although sexual transmission has been implicated in some cases among men who have sex with men (MSM). Hepatitis B and C are transmitted through blood and body fluids. Injection drug users (IDUs) are at high risk for acquiring hepatitis B and C through needle-sharing. Epidemiologic studies suggest that up to 40 – 60% of cases of hepatitis B in the U.S. are sexually transmitted. Most experts consider risk of sexual transmission of hepatitis C to be very low. Hepatitis A and B are vaccine-preventable diseases, and vaccination should be encouraged for sexually active populations.

### B. Diagnosis

1. History: malaise, fever, loss of appetite, abdominal pain, nausea / vomiting, jaundice, dark urine, arthralgias / polyarthritis are variably present; many cases of acute infection are completely asymptomatic
2. Physical Examination: right upper quadrant abdominal tenderness and hepatic enlargement; scleral or cutaneous icterus may occur
3. Laboratory: Serum markers of acute and chronic infection, based on the particular form of hepatitis: HAV IgM, HAV IgG, HBsAg, HBsAb, HBcAb, HCV Ab, HCV RNA. Also check CBC, chemistries, coagulation factors, liver function tests

### C. Treatment

Treatment for acute viral hepatitis is supportive: encourage fluid intake, bed rest, abstain from sexual contact until recovered. Treatment for chronic hepatitis B or C may be indicated and should be undertaken in consultation with an expert. Therapeutic agents may include lamivudine, ribavirin, or interferon.

#### **D. Sex partners**

Routine STD evaluation is recommended for all partners of patients with viral hepatitis. If sexual exposure to hepatitis A or B has occurred within the last 2 weeks, consider referral for post-exposure prophylactic immune globulin and vaccination.

#### **E. Screening and prevention**

1. Consider hepatitis A vaccination for MSM, injection and non-injection drug users, and persons with chronic liver disease (including chronic hepatitis B or C infection).
2. Consider hepatitis B vaccination for previously unvaccinated STD clinic attendees, persons with history of STD, multiple sex partners, or partners who are MSM or IDUs. Also consider for household members, sex partners, and drug-sharing partners of persons with chronic hepatitis B infection, persons on hemodialysis, or persons with occupational blood exposure.
3. Post-exposure prophylaxis (vaccine and immune globulin) may be indicated for hepatitis A and B, and should be undertaken in consultation with an expert.
4. Vaccine for hepatitis C is not available, and post-exposure prophylaxis with immune globulin has not been demonstrated to be effective. Refer to an expert for consultation.

### **III. HIV INFECTION**

#### **A. Clinical picture**

Human immunodeficiency virus (HIV) infection is a systemic process characterized by immunosuppression and the development of opportunistic infections. Patients with HIV disease may be asymptomatic for many years until CD<sub>4</sub> lymphocyte levels fall. Signs and symptoms of advanced HIV disease include generalized nontender lymphadenopathy, fever, malaise, anorexia, weight loss, diarrhea, cough, dyspnea, severe seborrheic dermatitis, oral or perianal candidiasis, hairy leukoplakia, facial warts or molluscum, herpes zoster, and severe or persistent HSV infections (oral, genital, anal). Some patients with acute HIV infection develop a transient flu-like syndrome and faint rash. The introduction of highly-active antiretroviral therapy (HAART) in the mid-1990s has reduced morbidity and mortality associated with HIV infection.

#### **B. Diagnosis**

The diagnosis of HIV infection is based on both clinical assessment and the results of the HIV EIA serologic test, confirmed by Western blot. All HIV-infected persons should be referred for comprehensive clinical and immunologic evaluation to assess the stage of disease. In general, STD clinics do not have the appropriate resources to provide long-term medical care for persons with HIV infection.

#### **C. Treatment**

All incident STDs in HIV-infected persons should be diagnosed and treated as per prescribed protocols. Specific treatment for HIV infection (e.g. antiretroviral agents) is not provided in the STD clinic context.

#### **D. Sex Partners**

Counsel risk reduction to all sexual or needle-sharing partners of persons with HIV infection. Encourage serological screening for HIV infection. Refer to HIV counselor to ensure that partner notification guidelines are followed.

## IV. ACUTE EPIDIDYMITIS

### A. Clinical picture

Epididymitis is characterized by scrotal pain, swelling, and exquisite tenderness of the affected testicular-epididymal complex. Symptoms usually develop and intensify over a 1-2 day period, but both gradual onset and acute onset of symptoms may be seen. Pain and tenderness are generally unilateral, and signs and symptoms of urethritis are often, but not always present. In sexually active men <35 years old, the most common pathogens are *N. gonorrhoeae* or *C. trachomatis*. Coliforms such as *E. coli* are most common in the following groups: (a) men >35 years old, (b) men of any age who have recently undergone urinary tract instrumentation or surgery, (c) men who practice insertive anal intercourse, and (d) men with anatomical abnormalities of the urinary tract.

### B. Diagnosis

1. Physical examination reveals epididymal and/or testicular tenderness, swelling, and induration. Urethral discharge may or may not be noted.
2. Laboratory testing should include the following:
  - a. Urethral Gram-stained smear
  - b. Urethral nucleic acid amplification test (NAAT) or culture for *N. gonorrhoeae* and *C. trachomatis*
  - c. If urethral Gram stain is negative, examine first-void uncentrifuged urine for leucocytes, Gram stain and culture

### C. Treatment

1. Antibiotics
  - a. Likely gonococcal or chlamydial infection – treat with ceftriaxone 250 mg IM single dose **PLUS** doxycycline 100 mg PO bid for 10 days
  - b. Likely caused by enteric organisms, or patient allergic to cephalosporins and/or tetracyclines – treat with ofloxacin\* 300 mg PO bid for 10 days **OR** levofloxacin\* 500 mg PO daily for 10 days

\*Avoid multiple-dose quinolone therapy for adolescents < 18 years of age.

2. Scrotal support, ice packs, or analgesics for symptomatic relief
3. Refer patient to urologist or appropriate health resource for re-examination in 72 hours to ensure response to therapy

**D. Sex Partners**

1. Chlamydial or gonococcal epididymitis: refer all partners within 60 days prior to onset of symptoms for full STD evaluation and epidemiologic treatment.
2. Coliform epididymitis: Routine referral of partners is not indicated.

# APPROACH TO SEXUAL ASSAULT

## A. Overview

The STD clinic is not the appropriate facility of first resort for patients who have experienced sexual assault. The complex medical, legal, and psychological issues related to sexual assault are best handled in an emergency care facility, where medical and nursing personnel are experienced in issues related to forensic specimen collection, preservation of the integrity of evidence, referral to law enforcement authorities, and referral to services for social and psychological support.

Nevertheless, CDC Treatment Guidelines recognize that STD medical personnel may be called upon to examine and treat patients who have experienced sexual assault. The following recommendations provide a framework for managing patients in the STD clinic setting who have declined referral to an emergency medical facility. Patients should be informed that the STD examination does **not** include essential aspects of the standard “rape kit” available in emergency medical facilities, such as nail scrapings, hair collection, or specimen collection which may be used as evidence in legal proceedings.

## B. Examination

1. Culture for *N. gonorrhoeae* and *C. trachomatis* from any sites of penetration or attempted penetration
2. Nucleic acid amplification test (NAAT) for *N. gonorrhoeae* and *C. trachomatis* may be used instead of culture, but positive results using these tests should be confirmed using a second NAAT that targets a different sequence
3. Wet mount and culture of vaginal pool specimen for trichomonal infection, and examination of wet mount for evidence of bacterial vaginosis or yeast infection
4. Serologic tests for syphilis, hepatitis B and (if consent obtained) HIV

### C. Treatment

1. Prophylactic antibiotic coverage
  - a. Ceftriaxone 125 mg IM single dose, **PLUS**
  - b. Metronidazole 2.0 g PO single dose, **PLUS**
  - c. Azithromycin 1.0 g PO single dose **OR** doxycycline<sup>‡</sup>  
100 mg PO bid for 7 days
2. Recommend post-exposure hepatitis B vaccination
3. Post-exposure HIV prophylaxis may be considered for cases with high risk of HIV exposure during the assault – consult an expert to determine need for therapy, selection of medications, and follow-up
4. Counsel use of condoms until treatment is completed
5. Consult Social Services for appropriate referrals to law enforcement, counseling, and support agencies

### D. Follow-up

Follow-up examination is recommended at 2 weeks and again at 12 weeks to ensure adequacy of response to prophylactic therapy and to monitor for possible serologic conversion. Establish follow-up appointment through women's health provider, private physician, or other appropriate facility before patient leaves initial visit.

<sup>‡</sup>Doxycycline contraindicated in pregnancy.

## APPENDIX I: STD Drugs in Pregnancy

### I. Safe To Use in Pregnancy

Amoxicillin  
 Amoxicillin/clavulanate  
 Cefixime  
 Cefoxitin  
 Ceftriaxone  
 Cephalexin  
 Clindamycin  
 Clotrimazole\*  
 Erythromycin\*\*  
 Liquid nitrogen (topical)  
 Metronidazole  
 Nitrofurantoin  
 Penicillin G (all forms)  
 Penicillin V  
 Permethrin  
 Probenecid  
 Pyrethrins  
 Spectinomycin  
 Trichloroacetic acid (topical)

### II. CONTRAINDICATED in Pregnancy

Ciprofloxacin  
 Doxycycline  
 Gatifloxacin  
 Gentamicin  
 Imiquimod  
 Ivermectin  
 Lindane (topical)  
 Levofloxacin  
 Moxifloxacin  
 Norfloxacin  
 Ofloxacin  
 Podofilox  
 Podophyllin  
 Tetracycline

### III. Qualified Use in Pregnancy

Acyclovir	Probably OK
Azithromycin	Probably OK
Famciclovir	Probably OK
Fluconazole	Avoid
Trimethoprim/Sulfa	Avoid in 3 <sup>rd</sup> trimester
Valacyclovir	Probably OK

\*Includes other topical imidazoles (miconazole, terconazole, butoconazole, etc.)

\*\*Except erythromycin estolate (Ilosone), which is contraindicated in pregnancy

**APPENDIX II:**  
**Approved Drugs for Use by Nurse Practitioners**  
**in Delivery of STD Care at John C. Murphy Health Center**  
**St. Louis County Department of Health**  
**St. Louis, MO**

Acyclovir (oral/topical)	Metronidazole (oral / intravaginal)
Amoxicillin	Miconazole (intravaginal / topical)
Amoxicillin/clavulanate	Moxifloxacin
Azithromycin	Nitrofurantoin
Butoconazole (intravaginal)	Norfloxacin
Cefixime	Ofloxacin
Cefoxitin	Penicillin G
Ceftriaxone	Penicillin V
Cephalexin	Permethrin
Ciprofloxacin	Podofilox
Clindamycin (oral / intravaginal)	Podophyllin
Clotrimazole	Probenecid
Doxycycline	Pyrethrins
Erythromycin	Spectinomycin
Famciclovir	Sulfamethoxazole
Fluconazole	Sulfisoxazole
Gatifloxacin	Terconazole
Imiquimod	Tetracycline
Ivermectin	Trichloroacetic acid (topical)
Levofloxacin	Trimethoprim
Lindane	Trimethoprim-sulfamethoxazole
Liquid nitrogen	Valacyclovir

## APPENDIX III: Relative Costs of Commonly Used STD Medications

<u>Disease</u>	<u>Medication</u>	<u>Typical Dosage</u>	<u>Average Wholesale Price (AWP) per Course (2002)</u>
BV	Clindamycin crm.	intravag. qd x 5 d	\$47.51
	Clindamycin ovl.	intravag. qhs x 3 d	44.41
	Clindamycin oral	300 mg PO bid x 7 d	52.04
	Metronidazole oral	2 gm PO x 1	2.91
	Metronidazole oral	500 mg PO bid x 7 d	10.19
	Metronidazole gel	intravag. qd x 5 d	44.82
Chlamydia	Azithromycin	1 gm PO x 1	22.75
	Doxycycline	100 mg PO bid x 7 d	3.99
	Erythromycin	500 mg PO qid x 7d	7.60
	Erythromycin ES	800 mg PO qid x 7d	13.01
	Levofloxacin	500 mg PO qd x 7d	64.55
	Ofloxacin	300 mg PO bid x 7d	75.81
Ectoparasites	Ivermectin	12 mg PO, repeat in 2 wks.	43.52
	Lindane lotion	2 oz. bottle	15.18
	Lindane shampoo	2 oz. bottle	16.12
	Permethrin crm.	60 g tube	32.76
	Pyrethrin shampoo	2 oz. bottle	6.29
Genital warts	Imiquimod cream	1 box (12 pkts)	141.54
	Podofilox	3.5 g gel	141.23
	Podofilox	3.5 g sol'n	103.62
Gonorrhea	Cefixime	400 mg PO x 1	unavailable
	Ceftriaxone	125 mg IM x 1	8.86
	Ciprofloxacin	500 mg PO x 1	5.25
	Gatifloxacin	400 mg PO x 1	8.96
	Levofloxacin	250 mg PO x 1	7.89
	Moxifloxacin	400 mg PO x 1	9.42
	Ofloxacin	400 mg PO x 1	5.71
	Spectinomycin	2 g IM x 1	24.80
Herpes - initial	Acyclovir	400 mg PO tid x 10d	5.54
	Famciclovir	250 mg PO tid x 10d	110.25
	Valacyclovir	1 g PO bid x 10d	128.87
Herpes - recurrent	Acyclovir	400 mg PO tid x 5d	2.77
	Famciclovir	125 mg PO bid x 5d	33.80
	Valacyclovir	500 mg PO bid x 5d	41.18
Syphilis	Benz. penicillin G	2.4 mill. units IM x 1	63.31
Yeast infection	Butoconazole	intravag. qhs x 7 d	32.69
	Clotrimazole crm.	intravag. qhs x 7 d	8.99
	Fluconazole	150 mg PO x 1	13.14
	Miconazole crm.	intravag. qhs x 7 d	10.98
	Terconazole crm.	intravag. qhs x 3 d or 7d	35.48