

Common Sexually Transmitted Diseases: STD 101 for Clinicians

Something for Everyone!

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for STD101

Topics

- **Background Information**
- **“Sores”**
- **“Drips”**

Background Information

Burden of STD in U.S.

STD	Cases Reported	Rate (per 100K)
Chlamydia	1.3 million (2010)	426
Gonorrhea	309,341 (2010)	100.8
Syphilis (P & S)	13,774 (2010)	4.5

STD	Estimated New Cases	Prevalent Cases/%
HSV	1.6 million (2000)	16.2% (2005-8)
HPV	6.2 million (2000)	26.8% F (2003-4)/ 1.3-72.9% M
Trichomoniasis	7.4 million (2000)	2.3 million (2001-4)
HIV	48,100 (2009)	>600,000 (2008)

Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2010*. Atlanta: U.S. Department of Health and Human Services; 2011; www.cdc.gov/hiv/topics/surveillance/resources/slides/incidence/index.htm; Weinstock et al. Perspectives on Sexual and Reproductive Health. 2004; Sutton et al CID 2007; 45:1319-26.; Dunne et al JAMA 2007; 297(8): 813-19; Dunne et al JID 2006; 194(8): 1044-57; Xu et al. MMWR 2010 ;59(15):456-59

STIs Facilitate HIV Transmission

- **Disruption of epithelial/mucosal barriers**
- **Increase the number of HIV target cells in the genital tract**
- **Increase expression of HIV co-receptors**
- **Induce secretion of cytokines (increase HIV shedding)**
- **HIV alters natural history of some STIs**



Fleming DT and Wasserheit JN. From Epidemiological Synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Inf* 1999;75:3-17.

Slide courtesy of AL/NC STD/HIV Prevention Training Center

Where Do People Go for STD Treatment?

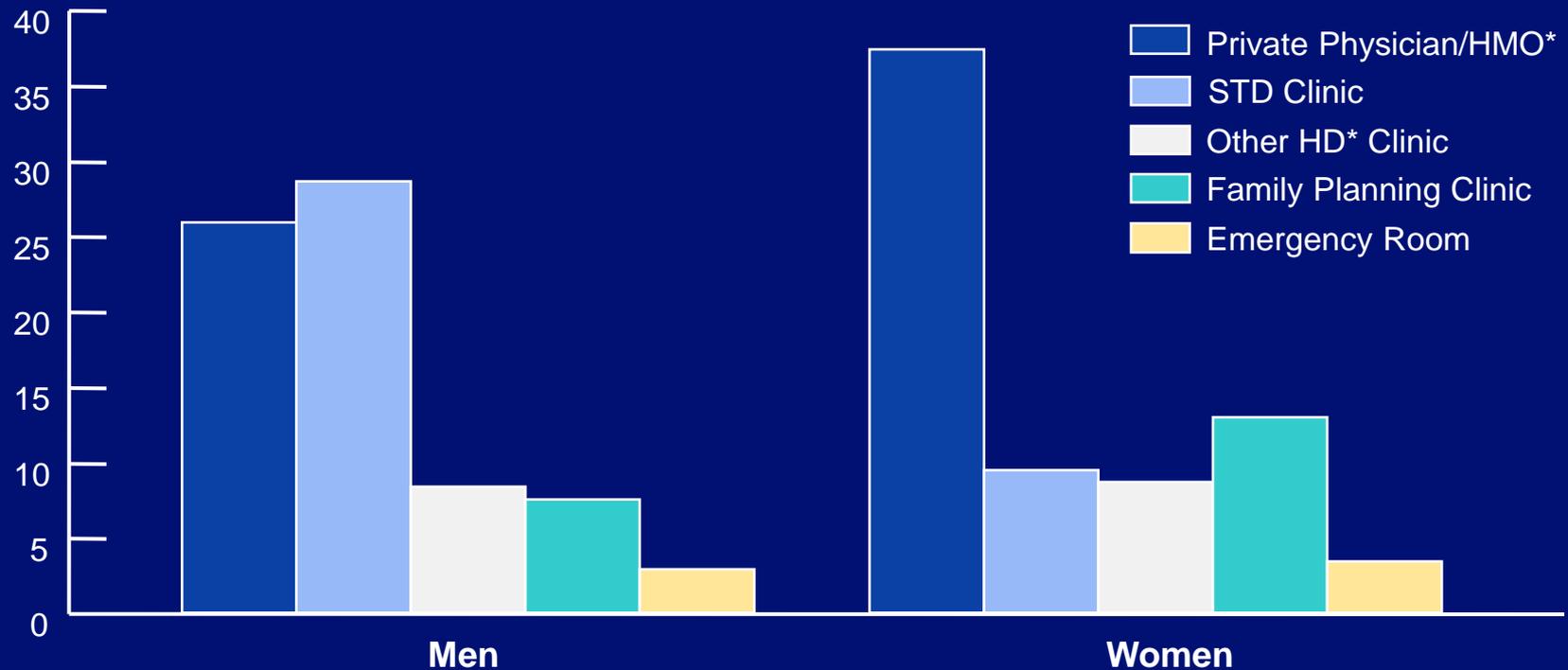
- **Population-based estimates from National Health and Social Life Survey**

Private provider	59%
Other clinic	15%
Emergency room	10%
STD clinic	9%
Family planning clinic	7%

Source: Brackbill et al. Where do people go for treatment of sexually transmitted diseases? Family Planning Perspectives. 31(1):10-5, 1999

Chlamydia—Percentage of Reported Cases by Sex and Selected Reporting Sources, United States, 2010

Percentage

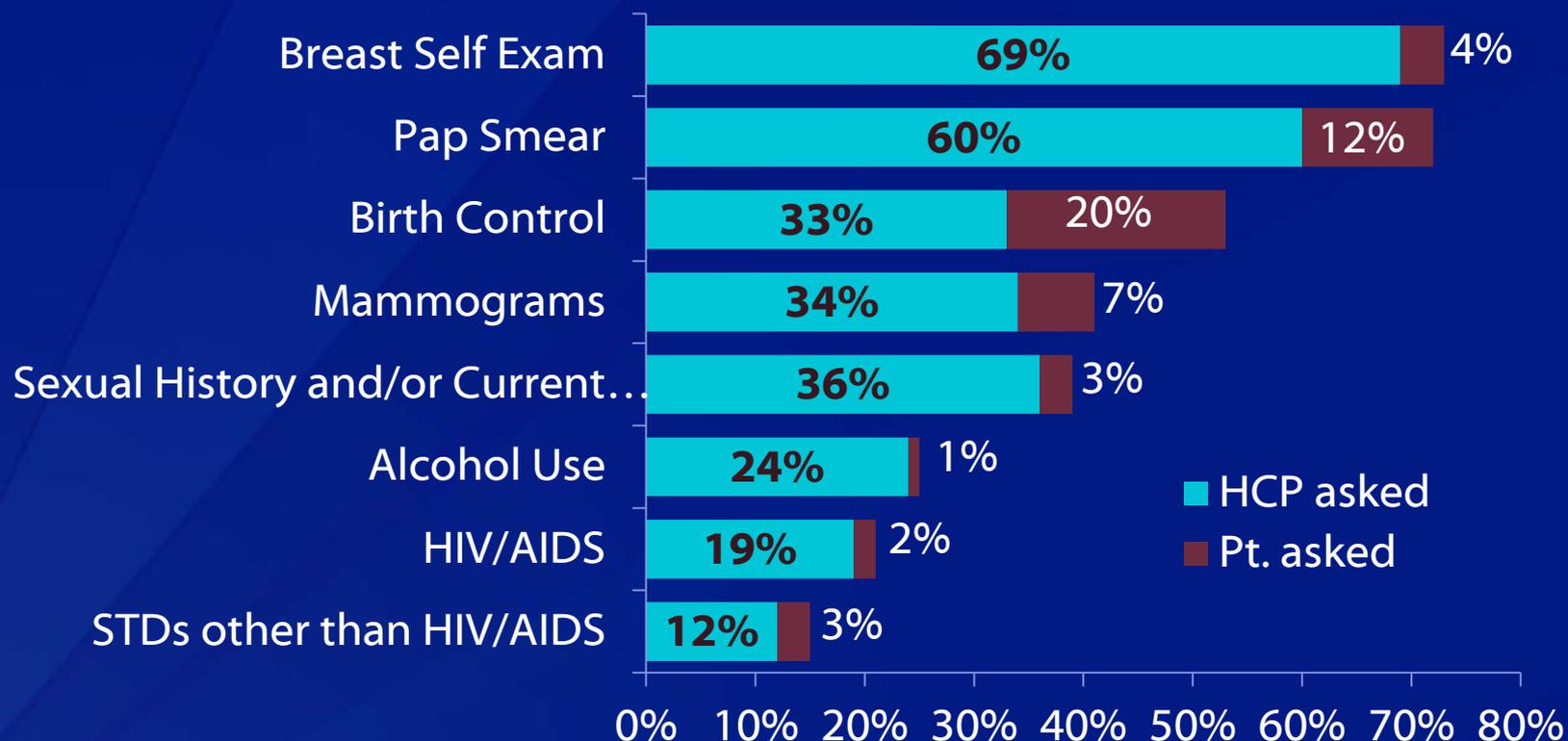


*HMO = health maintenance organization; HD = health department.

NOTE: These categories represent 72.5% of cases with a known reporting source. Of all cases, 11.6% had a missing or unknown reporting source.



Percent* of Women Who Said Topic Was Discussed During First Visit With New Gynecological or Obstetrical Doctor/Health Care Professional

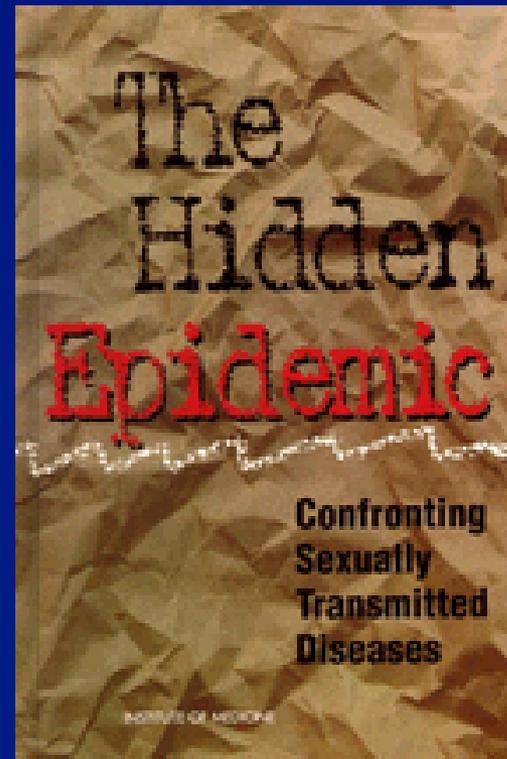


*Percentages may not total to 100% because of rounding or respondents answering "Don't know" to the question "Who initiated this conversation?"

Source: Kaiser Family Foundation/Glamour National Survey on STDs, 1997

“...the scope and impact of the STD epidemic are under-appreciated and the STD epidemic is largely hidden from public discourse.”

IOM Report 1997



STDs of Concern

- **“Sores” (ulcers)**
 - **Syphilis**
 - **Genital herpes (HSV-2, HSV-1)**
 - **Others uncommon in the U.S.**
 - **Lymphogranuloma venereum**
 - **Chancroid**
 - **Granuloma inguinale**

STDs of Concern (continued)

- **“Drips” (discharges)**
 - **Gonorrhea**
 - **Chlamydia**
 - **Nongonococcal urethritis / mucopurulent cervicitis**
 - **Trichomonas vaginitis / urethritis**
 - **Candidiasis**
 - **Bacterial vaginosis**
- **Other major concerns**
 - **Genital HPV (especially type 16, 18) and Cervical/Anal/Oral Cancer**

“Sores”

Syphilis

Genital Herpes (HSV-2, HSV-1)

Genital Ulcer Diseases – Does It Hurt?

- **Painful**
 - Chancroid
 - Genital herpes simplex
- **Painless**
 - Syphilis
 - Lymphogranuloma venereum
 - Granuloma inguinale

Primary Syphilis – Clinical Manifestations

- **Incubation: 10-90 days (average 3 weeks)**
- **Chancre**
 - **Early: macule/papule → erodes**
 - **Late: clean based, painless, indurated ulcer with smooth firm borders**
 - **Unnoticed in 15-30% of patients**
 - **Resolves in 1-5 weeks**
 - **HIGHLY INFECTIOUS**

Primary Syphilis Chancre



Primary Syphilis



Source: Centers for Disease Control and Prevention

Secondary Syphilis - Clinical Manifestations

- Represents hematogenous dissemination of spirochetes
- Usually 2-8 weeks after chancre appears
- Findings:
 - rash - whole body (includes palms/soles)
 - mucous patches
 - condylomata lata - HIGHLY INFECTIOUS
 - constitutional symptoms
- Sn/Sx resolve in 2-10 weeks

Secondary Syphilis Rash



Source: Florida STD/HIV Prevention Training Center

Secondary Syphilis: Generalized Body Rash



Secondary Syphilis Rash



Secondary Syphilis Rash



Secondary Syphilis



Secondary Syphilis – Condylomata Lata



Source: Florida STD/HIV Prevention Training Center

Early Syphilis – Diagnosis and Treatment

□ Diagnosis:

- Clinical presentation
- Darkfield
- Serology

□ Treatment:

- Benzathine PCN G 2.4 million units x 1

Genital Herpes Simplex - Clinical Manifestations

- **Transmission through direct contact – may be with asymptomatic shedding**
- **Primary infection commonly asymptomatic; symptomatic cases sometimes severe, prolonged, systemic manifestations**
- **Vesicles ⇒ painful ulcerations ⇒ crusting**
- **Recurrence a potential**

HSV-2 Infection: Who knows it?

	% Seropositive for HSV-2	% Reporting history of genital herpes	Sensitivity
NHANES III	21.9	2.6	9.2
Black			3.7
Hispanic			3.8
White			12.2
Suburban MD Office	25.5	4.3	11.9
Project Respect	41	5	12
JCDH STD-males	45	6	36 (3 questions)

Fleming et al. NEJM 1997; 337:1105. Gottlieb et al. JID 2002; 186:1381-89. Leone P et al. Sex Transm Dis. 2004; 31(5): 311-316. Sizemore et al, Sex Trans Inf, 2005;81:303-5.

HSV: Diagnosis and Treatment

□ **Diagnosis:**

- Culture
- Serology (Western blot)
- PCR

□ **Treatment:**

- Acyclovir
- Valacyclovir
- Famciclovir

Genital Herpes Simplex



Genital Herpes Simplex



Genital Herpes Simplex in Females



Genital Herpes Simplex



 Florida STD/HIV
PREVENTION TRAINING CENTER

Source: Florida STD/HIV Prevention Training Center

“Drips”

Gonorrhea

Nongonococcal urethritis

Chlamydia

Mucopurulent cervicitis

Trichomonas vaginitis and urethritis

Bacterial vaginosis

Gonorrhea - Clinical Manifestations

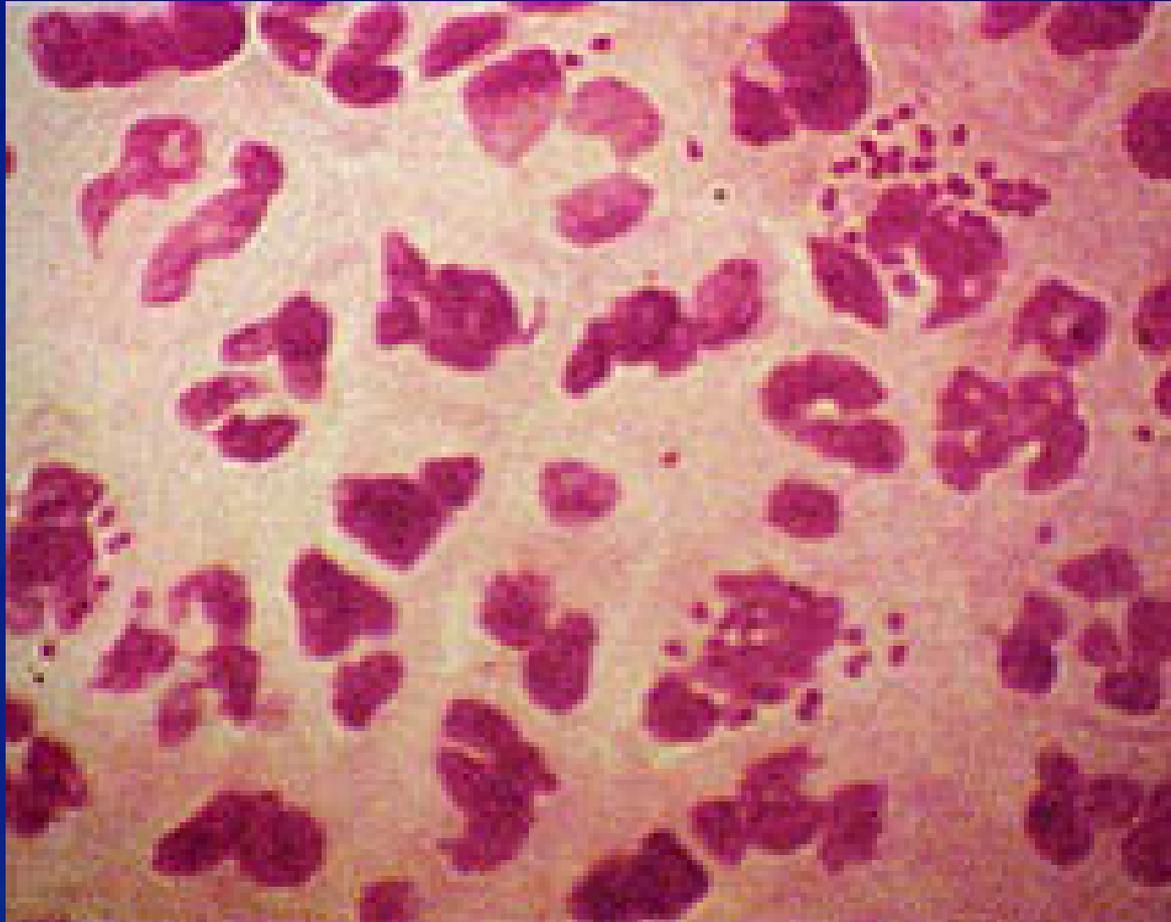
- **Urethritis - male**
 - Incubation: 1-14 d (usually 2-5 d)
 - Sx: Dysuria and urethral discharge (5% asymptomatic)
 - Complications
- **Urogenital infection - female**
 - Endocervical canal primary site
 - 70-90% also colonize urethra
 - Incubation: unclear; sx usually in 10 d
 - Sx: majority asymptomatic; may have vaginal discharge, dysuria, urination, labial pain/swelling, abdominal pain
 - Complications

Gonorrhea



 Florida STD/HIV
PREVENTION TRAINING CENTER

Gonorrhea Gram Stain



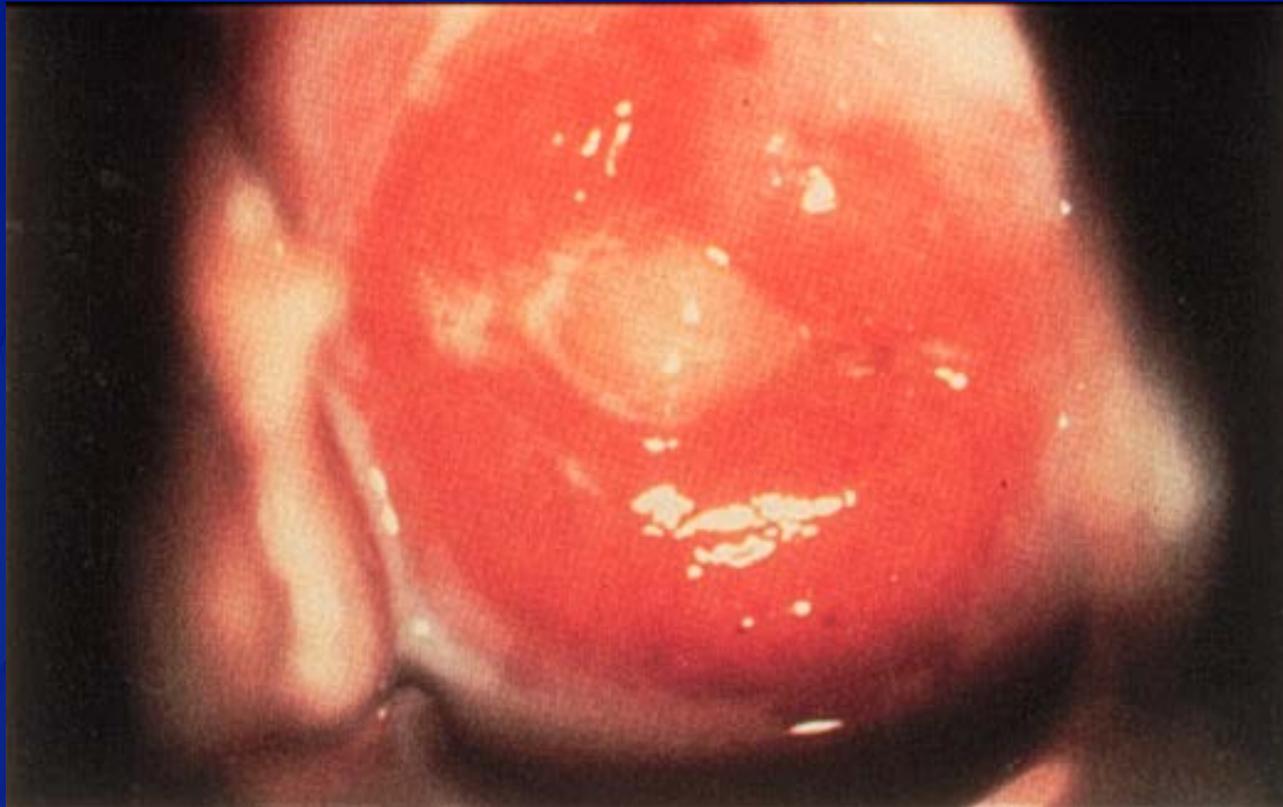
Nongonococcal Urethritis



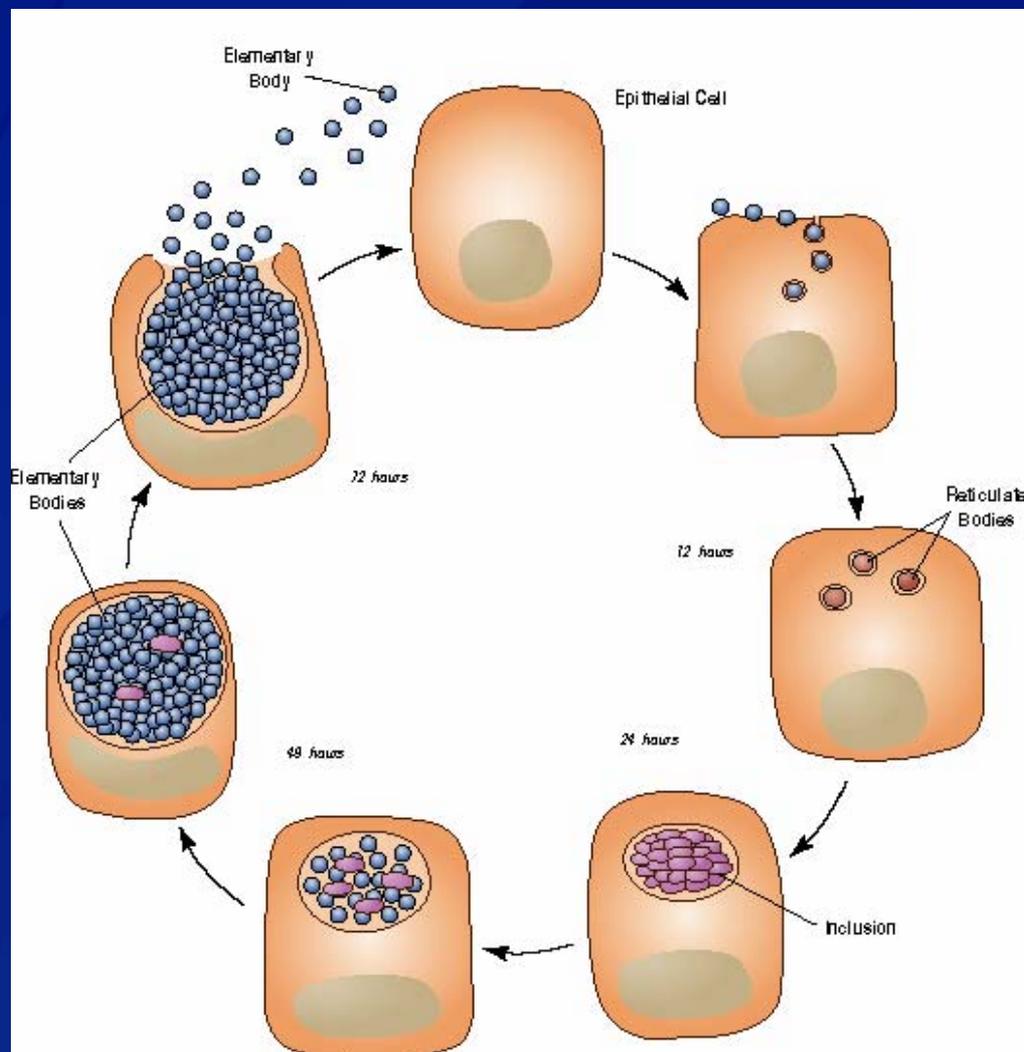
Nongonococcal Urethritis

- **Etiology:**
 - 20-40% *C. trachomatis*
 - 20-30% genital mycoplasmas (*Ureaplasma urealyticum*, *Mycoplasma genitalium*)
 - Occasional *Trichomonas vaginalis*, HSV
 - Unknown in ~50% cases
- **Sx:** Mild dysuria, mucoid discharge
- **Dx:** Urethral smear ≥ 5 PMNs (usually ≥ 15)/OI field
Urine microscopic ≥ 10 PMNs/HPF
Leukocyte esterase (+)

Mucopurulent Cervicitis



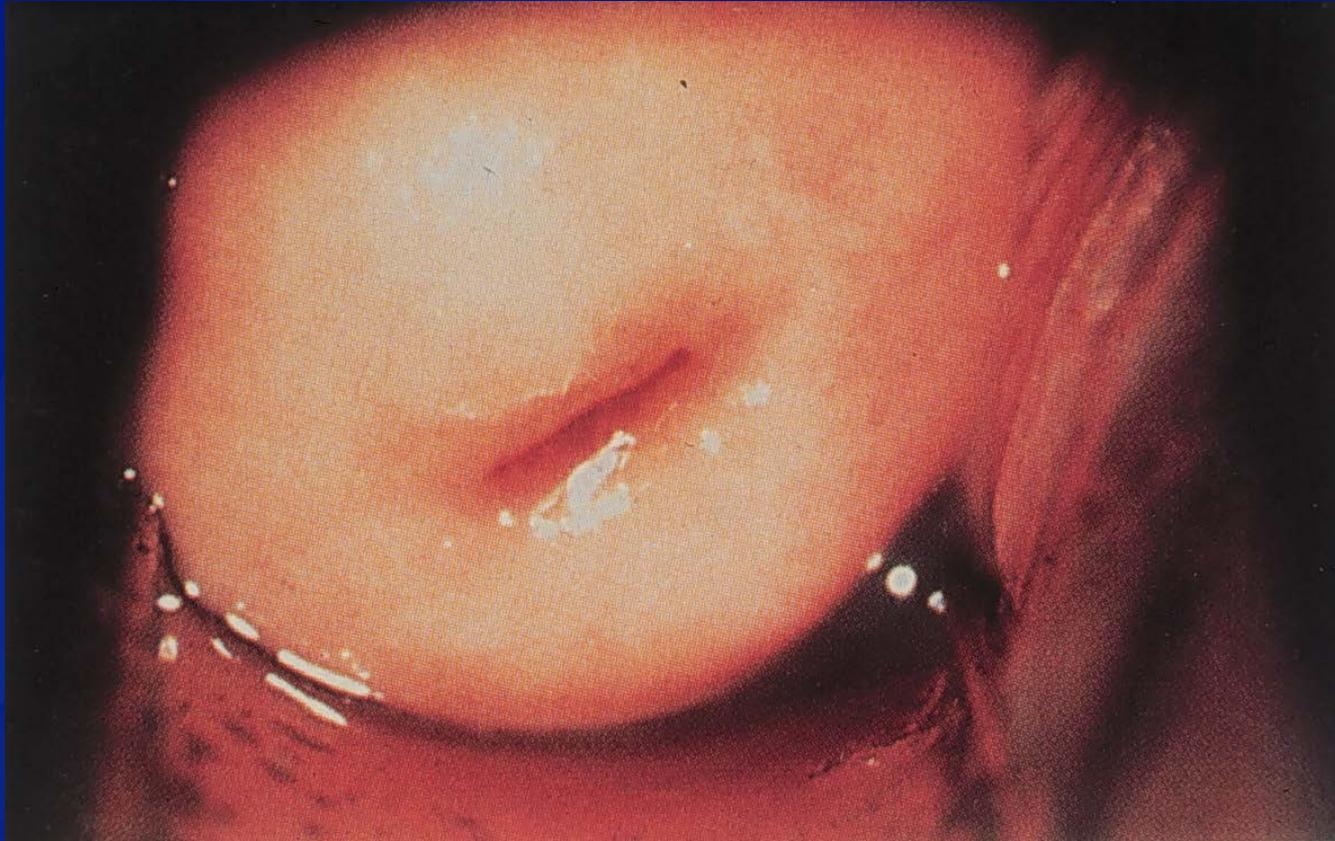
Chlamydia Life Cycle



Chlamydia trachomatis

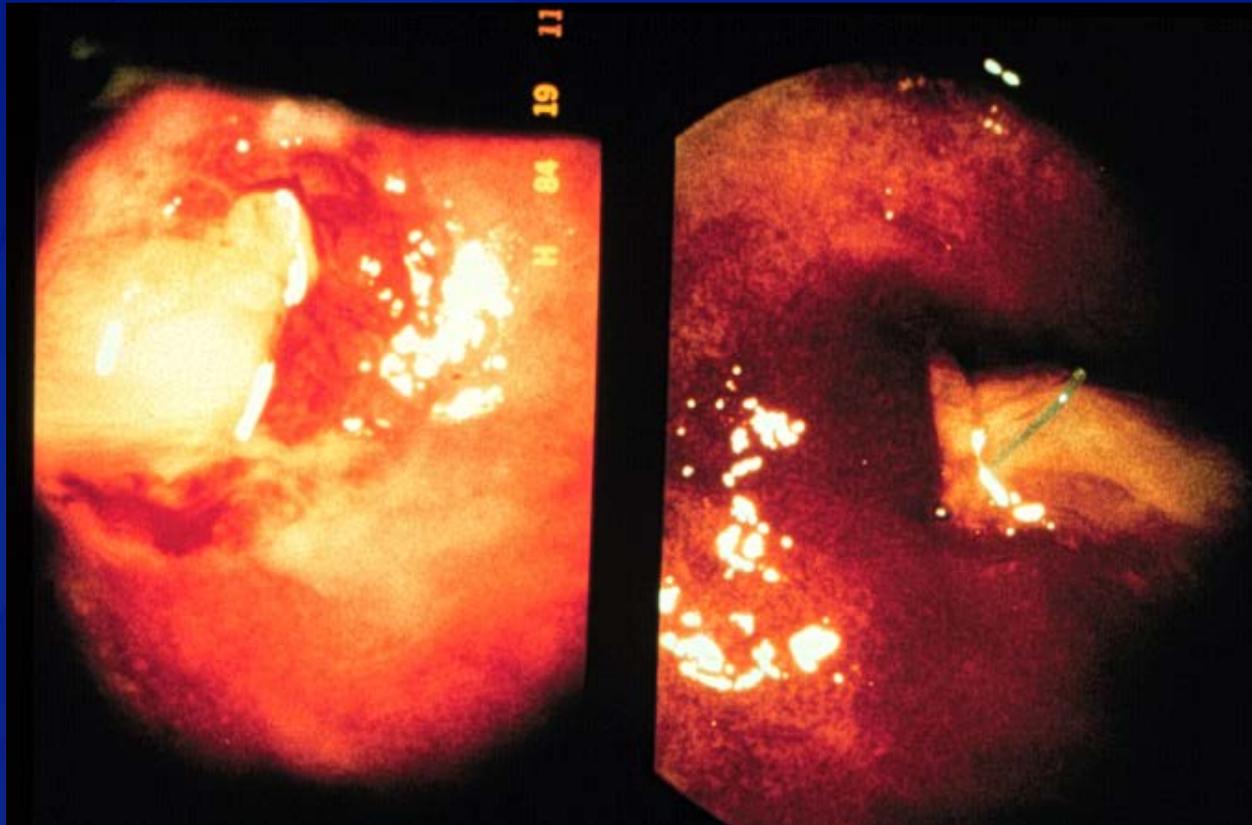
- **Clinical Manifestations:**
 - **Mostly asymptomatic**
 - **cervicitis, urethritis, proctitis, lymphogranuloma venereum, and pelvic inflammatory disease**
- **Complications: Potential to transmit to newborn during delivery**
 - **Conjunctivitis, pneumonia**

Normal Cervix



Source: Claire E. Stevens, Seattle STD/HIV Prevention Training Center

Chlamydia Cervicitis



Laboratory Testing: CT and GC

- Gram stain (gonorrhea)
- Culture
- Non-culture non-amplified tests
- Commercially available NAATs include:
 - Becton Dickinson *BDProbeTec*®
 - Gen-Probe *AmpCT, Aptima*®
 - Roche *Amplicor*®
- Specimen types: urine, cervical, urethral, vaginal, liquid PAP (not as sensitive)
- Serology (CT in setting of LGV)

2010 CDC STD Treatment Guidelines: Gonorrhea

- **Recommended**
 - **Ceftriaxone 250 mg IM x 1**
OR IF NOT AN OPTION...
 - **Cefixime 400 mg PO x 1 Or**
 - **Single-dose injectible cephalosporin regimens**
PLUS
 - **Azithromycin 1gm PO x 1 Or**
 - **Doxycycline 100mg PO BID x 7d**

2010 CDC STD Treatment Guidelines

Chlamydia/NGU

Recommended:

Azithromycin 1gm po x 1 Or

Doxycycline 100mg po BID x 7d

Alternative:

Erythromycin base 500mg po QID x 7d Or

Erythromycin EES 800mg po QID x 7d Or

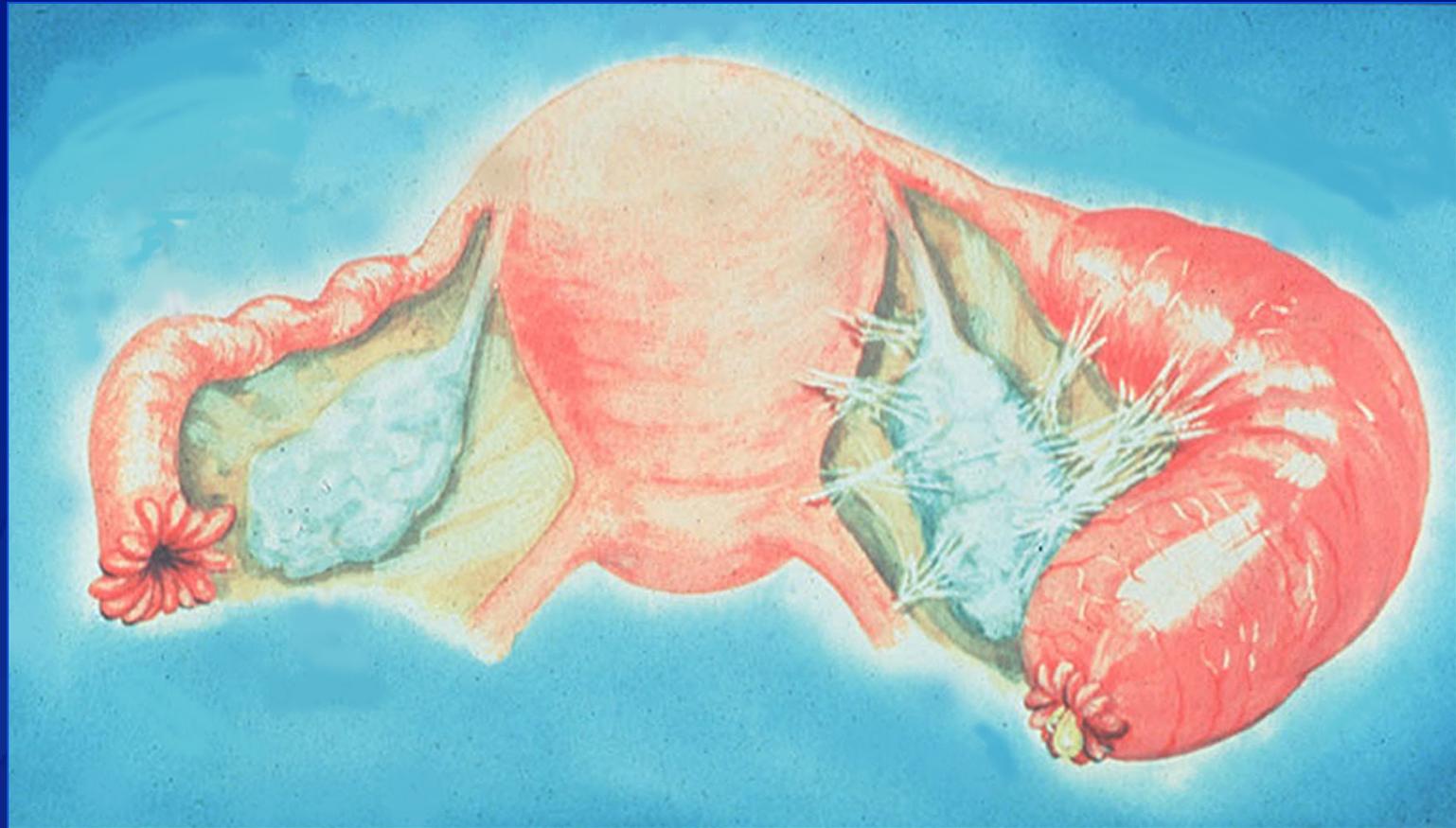
Levofloxacin 500mg po qd x 7d Or

Ofloxacin 300mg po BID x 7d

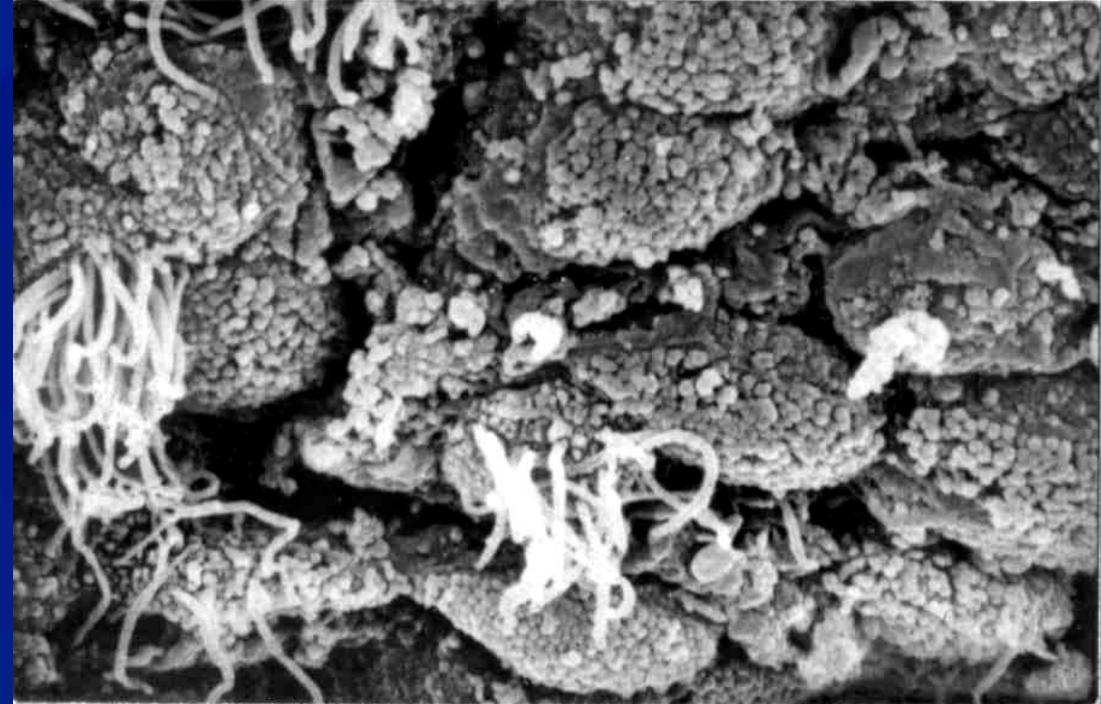
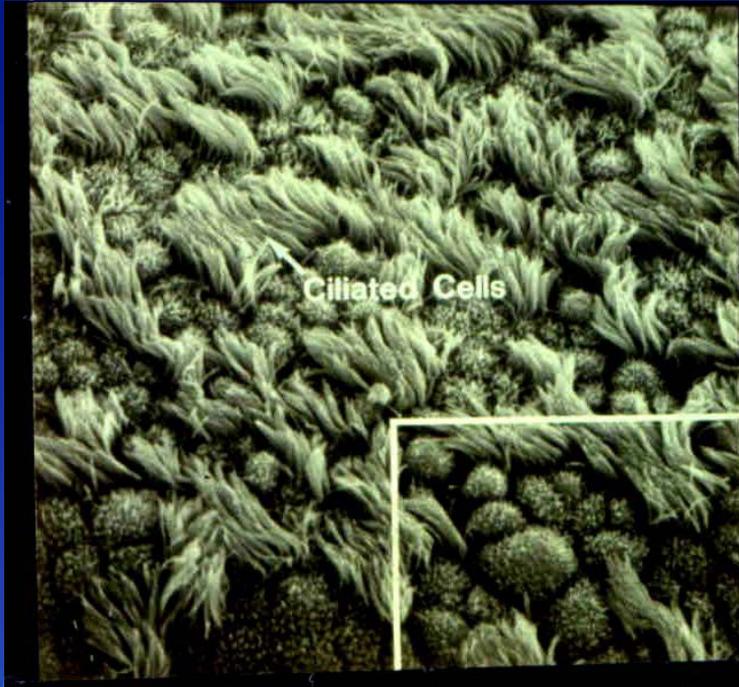
Pelvic Inflammatory Disease (PID)

- **10%-20% women with GC develop PID**
- **In Europe and North America, higher proportion of *C. trachomatis* than *N. gonorrhoeae* in women with symptoms of PID**
- **CDC minimal criteria**
 - **uterine adnexal tenderness, cervical motion tenderness**
- **Other symptoms include**
 - **endocervical discharge, fever, lower abdominal pain**
- **Complications:**
 - **Infertility: 15%-24% with 1 episode PID secondary to gonorrhea or chlamydia**
 - **7X risk of ectopic pregnancy with 1 episode PID**
 - **chronic pelvic pain in 18%**

Pelvic Inflammatory Disease



C. trachomatis Infection (PID)



**Normal Human
Fallopian Tube Tissue**

PID Infection

2010 CDC STD Treatment Guidelines: PID Outpatient Treatment

- ❑ **Ceftriaxone 250mg IM x 1 PLUS doxycycline 100mg po BID x 14d +/- metronidazole 500mg po BID x 14d**
- ❑ **Cefoxitin 2g IM x 1 and probenecid 1g po x 1 PLUS doxycycline 100mg po BID x 14d +/- metronidazole 500mg po BID x 14 d**
- ❑ **Other parenteral third generation cephalosporin PLUS doxycycline 100mg po BID x 14d +/- metronidazole 500mg po BID x 14d**

Trichomonas vaginalis

- **Sexually transmitted parasite**
- **Most common treatable STD**
- **Estimated prevalence:**
 - **7.9-13% in the general female population**
 - **Prevalence increases with age**
 - **Highest rates in AA (20.2%)**
 - **Highest rates in southeast (14.4%)**
 - **6.1% to 33% prevalence in HIV+ women using wet prep +/- culture; up to 52.6% with nucleic acid amplification testing**
- **Several studies support the epidemiological association between TV and HIV and decreased genital HIV shedding with treatment of TV**

Clinical Manifestations of *T. vaginalis*



MOST TRICHOMONAL INFECTIONS ARE ASYMPTOMATIC!!!

Diagnostic Tests for TV

- **Females**

- Wet prep
- Culture
- OSOM Trichomonas Rapid Test (Genzyme Diagnostics, Cambridge, Massachusetts)
- Affirm™ VP III (Becton Dickinson, San Jose, California) *T. vaginalis*, *G. vaginalis*, and *C. albicans*.
- Gen-Probe APTIMA Combo 2®
- Roche COBAS® Amplicor PCR

- **Males**

- Culture (multiple specimen types)
- Gen-Probe APTIMA Combo 2®
- Roche COBAS® Amplicor PCR

2010 CDC STD Treatment Guidelines: *Trichomonas vaginalis*

Recommended:

- **Metronidazole 2gm PO x 1 dose Or**
- **Tinidazole 2gm PO x 1 dose**

Alternative:

- **Metronidazole 500mg PO BID x 7d***

*Consider as preferred in HIV-infected women

Bacterial Vaginosis

- Polymicrobial clinical syndrome characterized by loss of H₂O₂-producing *Lactobacillus* sp.
- Most common cause of vaginitis/osis
- Prevalence varies by population:
 - 5%-25% among college students; 12%-61% among STD patients
- Complications:
 - Premature rupture of membranes, premature delivery, low birth-weight delivery, acquisition of HIV, development of PID, post-operative infections after gynecological procedures

Bacterial Vaginosis

- **50% asymptomatic**
- **Signs/symptoms when present:**
 - **malodorous (fishy smelling) vaginal discharge**
- **Diagnosis:**
 - **Amsel Criteria, vaginal Gram stain, rapid tests**

Indication to treat BV:

Symptoms!

Bacterial Vaginosis Treatment

CDC-recommended regimens:

- **Metronidazole 500 mg orally twice a day for 7 days**
- **Metronidazole gel 0.75%, one full applicator (5 grams) intravaginally, once a day for 5 days**
- **Clindamycin cream 2%, one full applicator (5 grams) intravaginally at bedtime for 7 days**

Alternative regimens:

- **Tinidazole 2gm po qd x 2 days**
- **Tinidazole 1gm po qd x 5 days**
- **Clindamycin 300 mg orally twice a day for 7 days**
- **Clindamycin ovules 100 g intravaginally once at bedtime for 3 days**

HPV: Epidemiology

- **Among sexually active women*:**
 - **>50% have been infected with one or more genital types**
 - **15% have current infection**
 - **50-75% of these are high-risk**
 - **1% have genital warts**
- **Prospective study of young women#**
 - **36mo incidence rate of 43%**
- **NHANES survey – 26.8% women 14-59 with detectable HPV DNA (vaginal swabs)**

*Koutsky. Am J Med 1997; Koutsky et al. Sex Trans Dis 1999. Svare et al JID 1997, Wideroff et al JID 1996;

*#Ho et al. NEJM. 1998

HPV

- **Transmission: skin-to-skin contact**
- **High-risk (16, 18 etc) vs low-risk (6, 11 etc) types**
 - **Low-risk types: genital warts**
 - **High-risk HPV infection is causally associated with cervical cancer and other anogenital squamous cell cancers (e.g. anal, penile, vulvar, vaginal)**
- **Diagnosis: Clinical exam, cytology, nucleic acid amplification methods (in conjunction with cytology for high-risk HPV types)**
- **Treatment: Topical and destructive modalities**

HPV-Associated Cervical Cancer

- **400,000-500,000 cases of cervical cancer per year world-wide**
- **In US, rates down but still 12,280 cases and 4,021 deaths from cervical cancer in 2007**

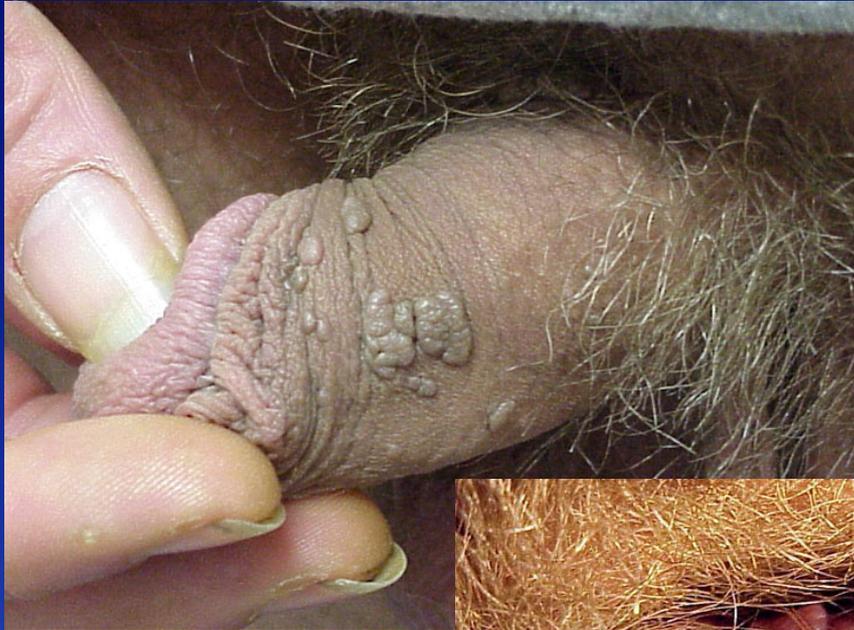
Anal SCCA

- **Incidence of squamous cell cancer of the anus (SCCA) in the United States has increased by ~96% in men and ~39% in women**
- **Incidence of anal cancer in MSM estimated to be 35 cases / 100,000 population**
 - **This is comparable to the incidence of cervical cancer before the introduction of routine pap screening**

Perianal Warts



HPV Penile Warts



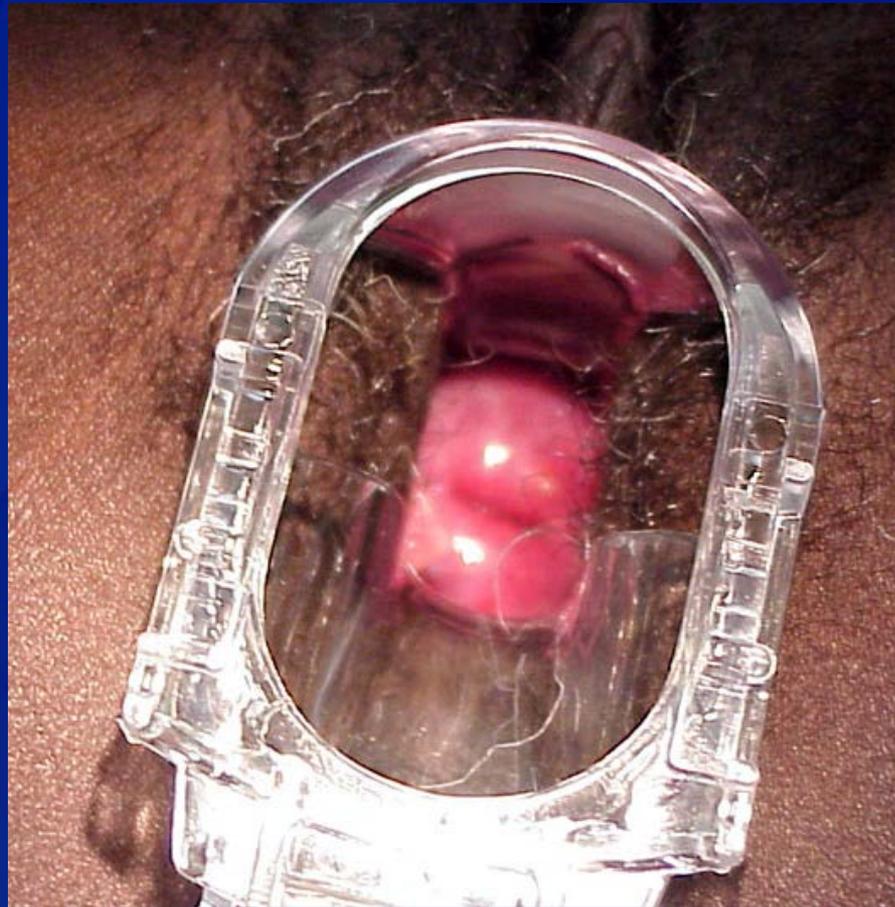
Source: Cincinnati STD/HIV Prevention Training Center

Intrameatal Wart of the Penis (and Gonorrhea)



Source: Florida STD/HIV Prevention Training Center

HPV Cervical Warts



Source: Cincinnati STD/HIV Prevention Training Center

HPV Warts on the Thigh



Possible HPV on the Tongue



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HPV Vaccines - Females

Cervarix™ – GSK

- **HPV 16 and 18**
- **0, 1, 6mo dosing**
- **Females 10-25yrs**
- **Approved 10/09**

Gardasil™ - Merck

- **HPV types 6,11,16,18**
- **0, 2, 6mo dosing**
- **Females 9-26yrs**
- **Approved 6/06**

Efficacy approximately 100% against precancerous lesions caused by specific types in the vaccine!

Gardasil for Males

- **Initial study demonstrated 90% efficacy for preventing external lesions caused by HPV types 6, 11, 16 and 18 in men 16-26y**
- **FDA approved (10/09) for males 9-26 for prevention of genital warts**

Gardasil for Anal Cancer Prevention

- **HPV associated with approximately 90% of anal cancer**
- **Vaccine approved for new indication December 22, 2010**
- **Males and females 9-26 years of age**
- **Prevention of anal cancer and associated precancerous lesions caused by HPV types 6, 11, 16, 18**

Questions?

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of STD Prevention

