

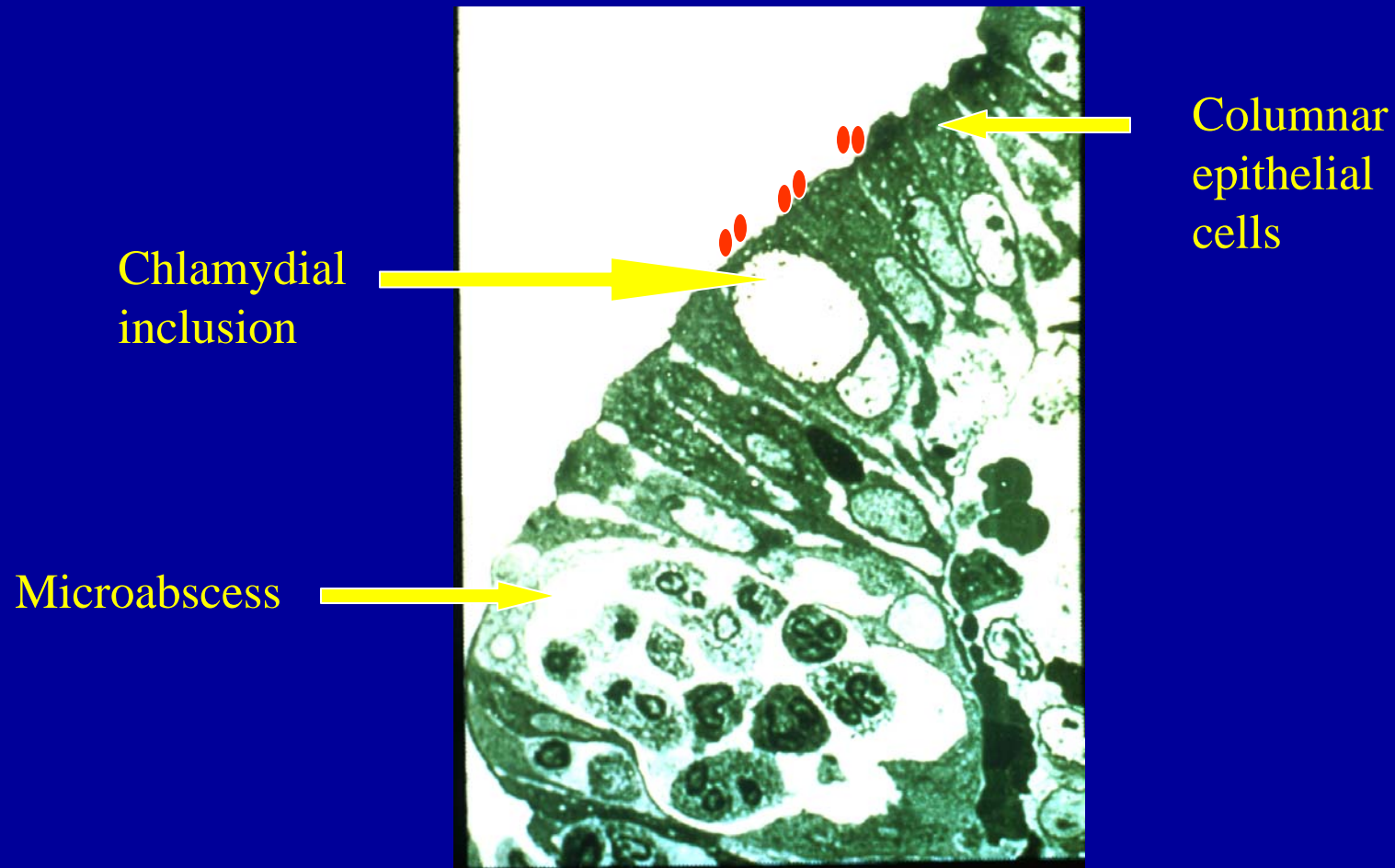
# STD Update 1

## Discharge Syndromes

David H. Martin, M.D.

Director, Gulf South STI TM Cooperative Research Center  
Chief, Section of Infectious Diseases, LSU Medical School  
New Orleans

# Electron Micrograph of a Chlamydia Infected Endocervix



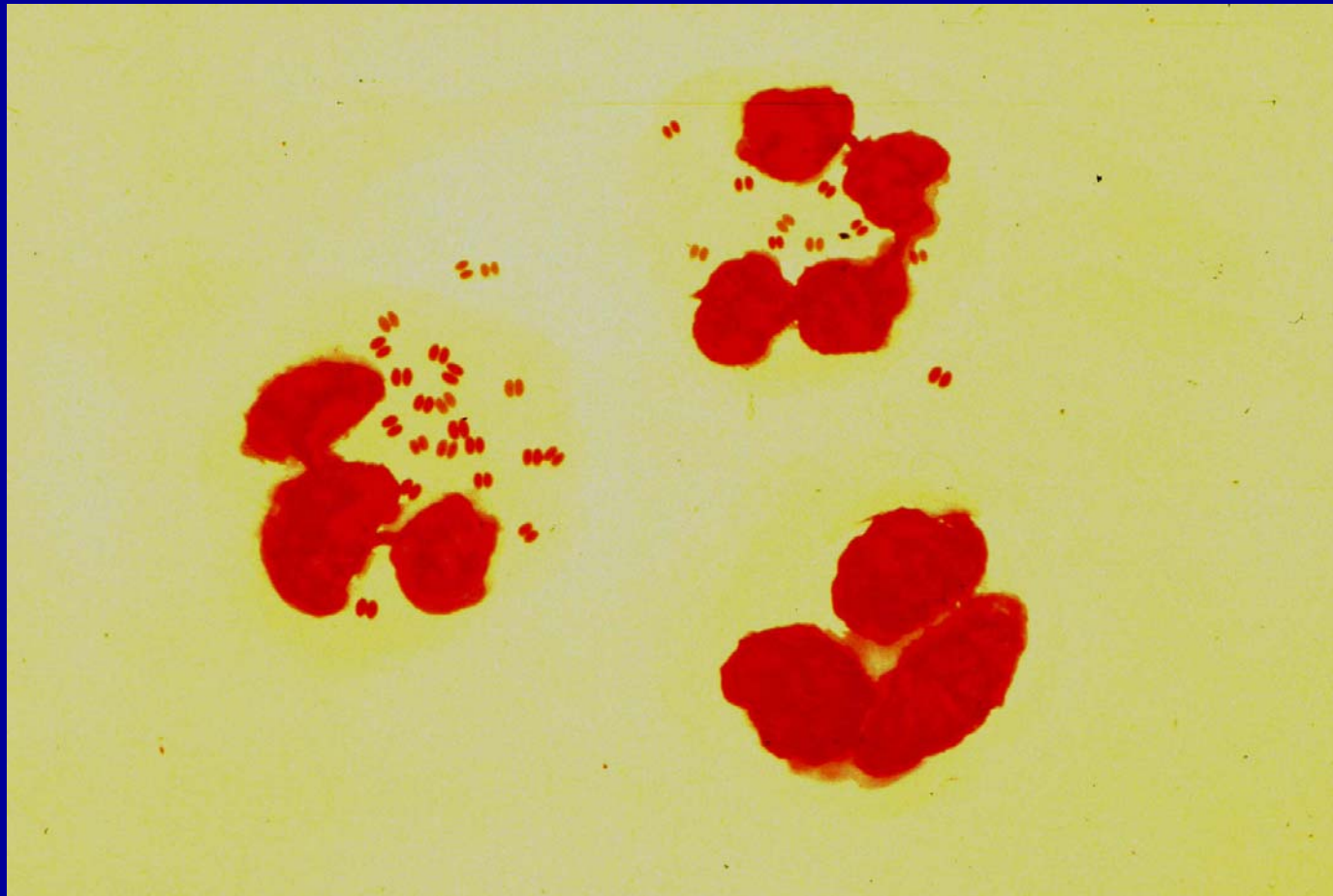
# Gonococcal Urethritis



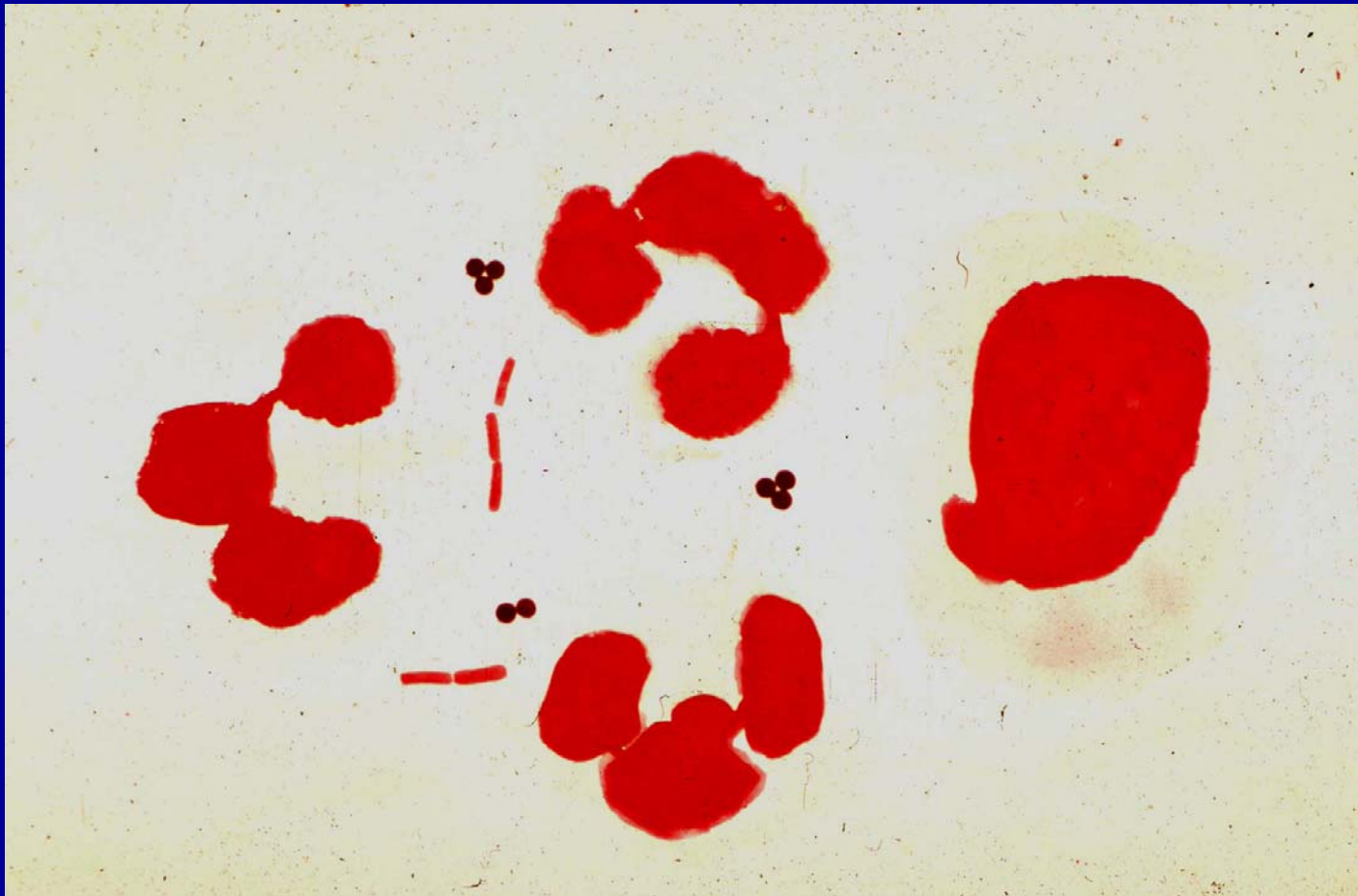
# Nongonococcal Urethritis



# Gram Negative Intracellular Diplococci (GNID)



# Inflammation Without GNID



# Etiology of Nongonococcal Urethritis - 2000

<i>Chlamydia trachomatis</i>	20-40%
<i>Ureaplasma urealyticum</i>	20-30%
<i>Trichomonas vaginalis</i>	3-8%
Herpes simplex virus	1-2%
Unknown	30-50%

# 2006 CDC STD Treatment Guidelines

## Nongonococcal Urethritis (NGU)

### Recommended Regimens

**Azithromycin** 1 gram, orally, single dose

**Doxycycline** 100 mg orally 2 times a day  
for 7 days

CDC STD Treatment Guidelines. MMWR 2006

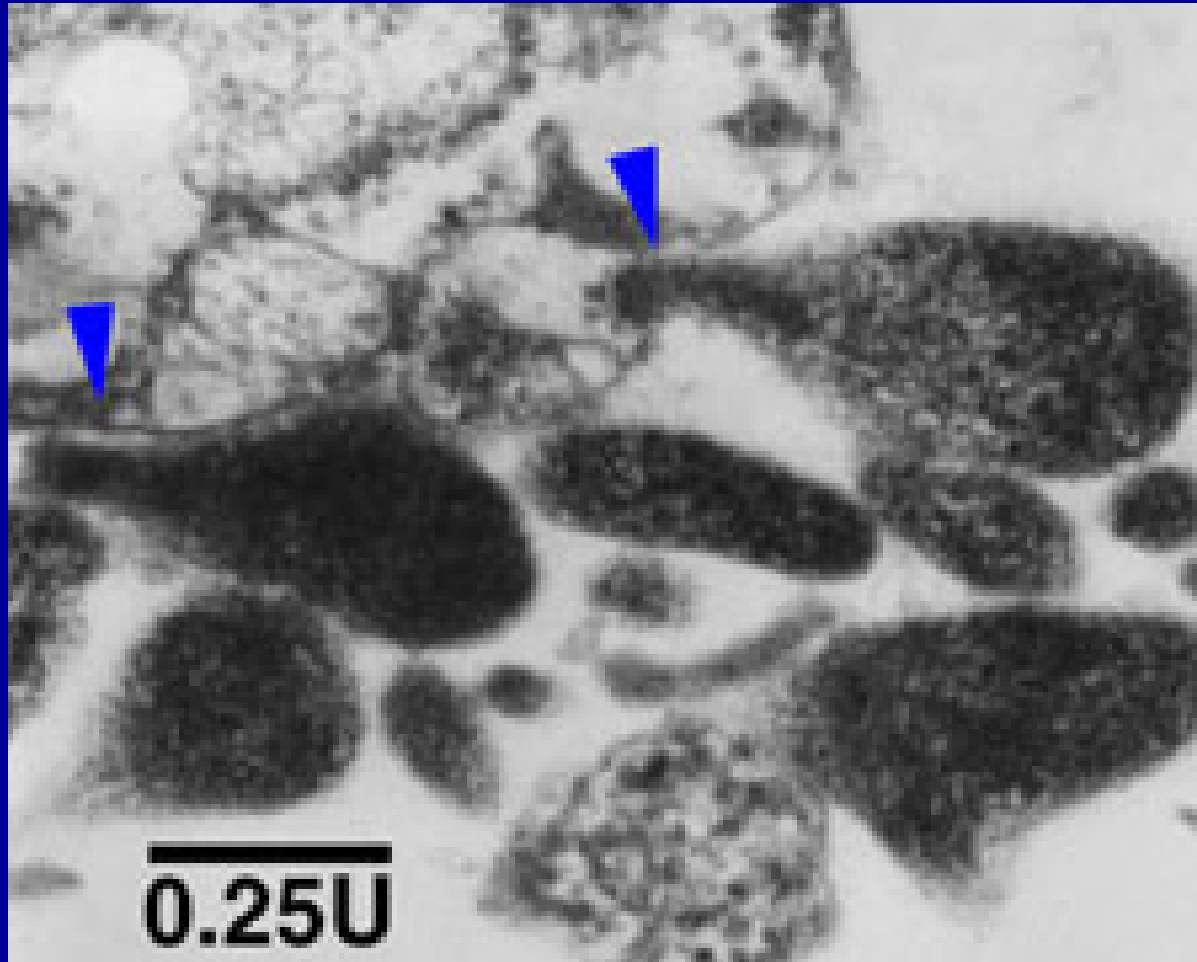
<http://www.cdc.gov/std/treatment/>



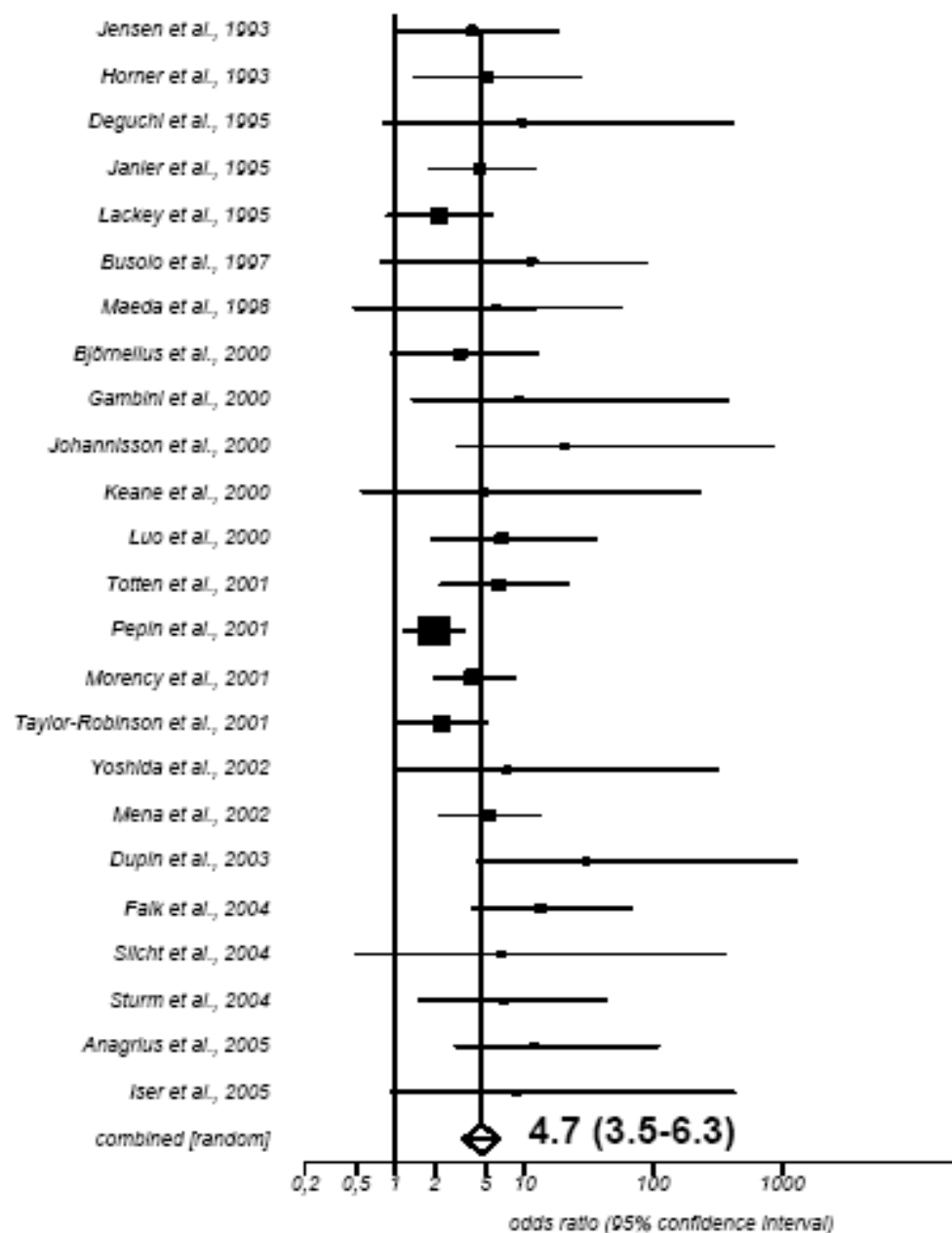
# Etiology of Nongonococcal Urethritis - 2008

<i>Chlamydia trachomatis</i>	20-40%
<i>Mycoplasma genitalium</i>	15-25%
<i>Ureaplasma urealyticum</i>	10-20% ?
<i>Trichomonas vaginalis</i>	5-15%
Adenovirus	1-4%
Herpes simplex virus	1-2%
Unknown	15-30%

# *Mycoplasma genitalium*



# Association between *M. genitalium* and male NGU



Jensen JS.Eur  
Acad Dermatol  
Venereol. 18;  
2004: 1-11.

## *M. genitalium* Treatment Issues

- Microbiologic treatment failure rate following multi dose doxycycline is ~60%.
- Despite persistence of the organism, initially most men respond clinically to treatment.
- Clinical relapses occur in more than half of the failures between 3 to 5 weeks following treatment.
- Success rate for one gram of azithromycin is ~85%; most of these failures respond to a five day course of the drug.
- A few men appear to have high levels of resistance to macrolides. These may respond to moxifloxacin.

# Possible Complications of *M. genitalium* Infection

Mucopurulent cervicitis	
Endometritis/PID	
Tubal factor infertility	
Ectopic pregnancy	
Abnormal pregnancy outcome	
Enhancement of HIV infection	
Epididymitis	

# Adenovirus Urethritis



O'Mahony C. International J STI and AIDS. 2006;17:203









# 2006 CDC STD Treatment Guidelines

## Uncomplicated Gonococcal Infections

- Recommended Regimens

**Ceftriaxone** 125 mg IM in a single dose

or

~~**Cefixime** 400 mg orally in a single dose~~

or

**Ciprofloxacin** 500 mg orally in a single dose

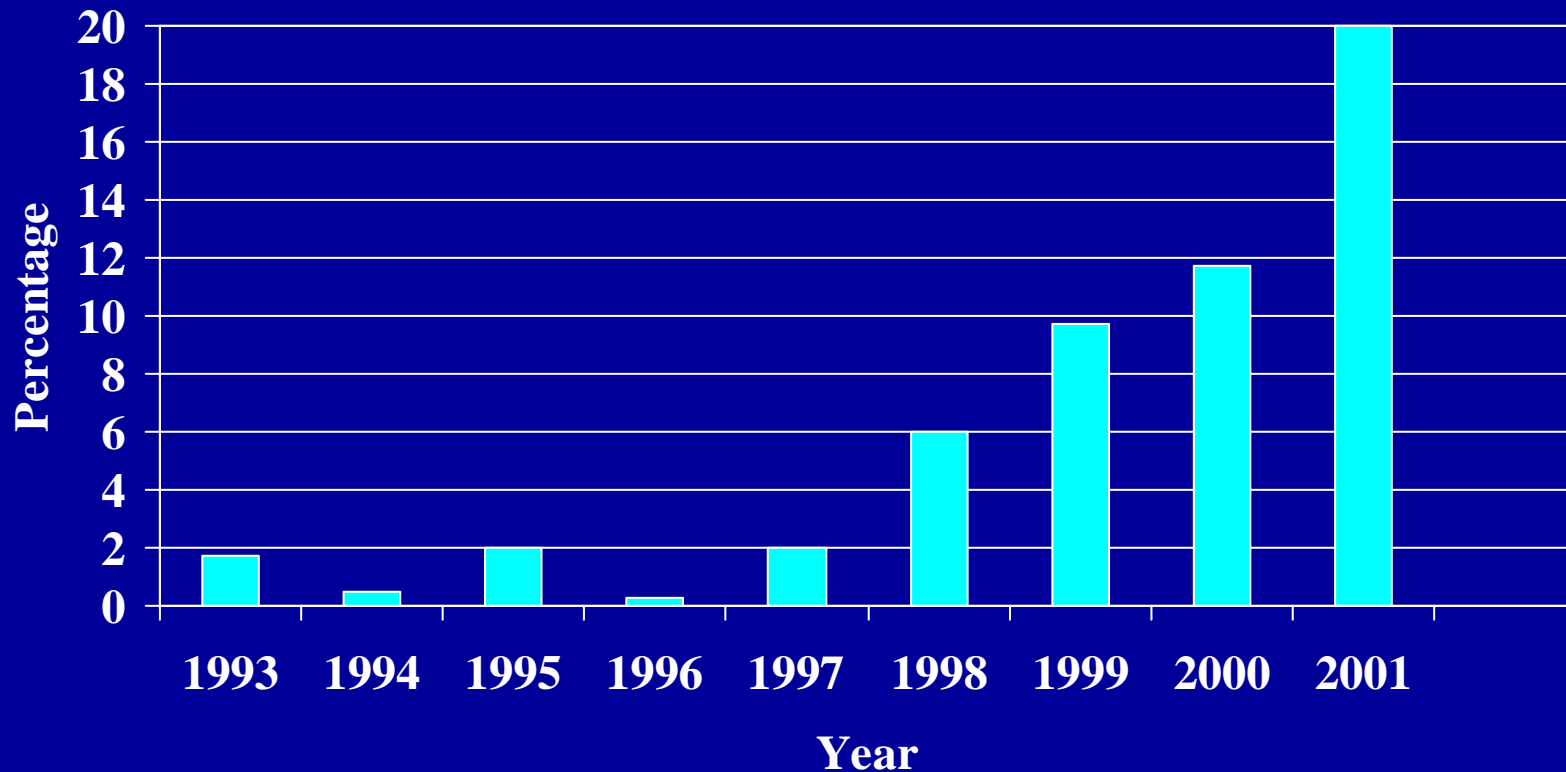
or

**Levofloxacin 250** mg orally in a single dose

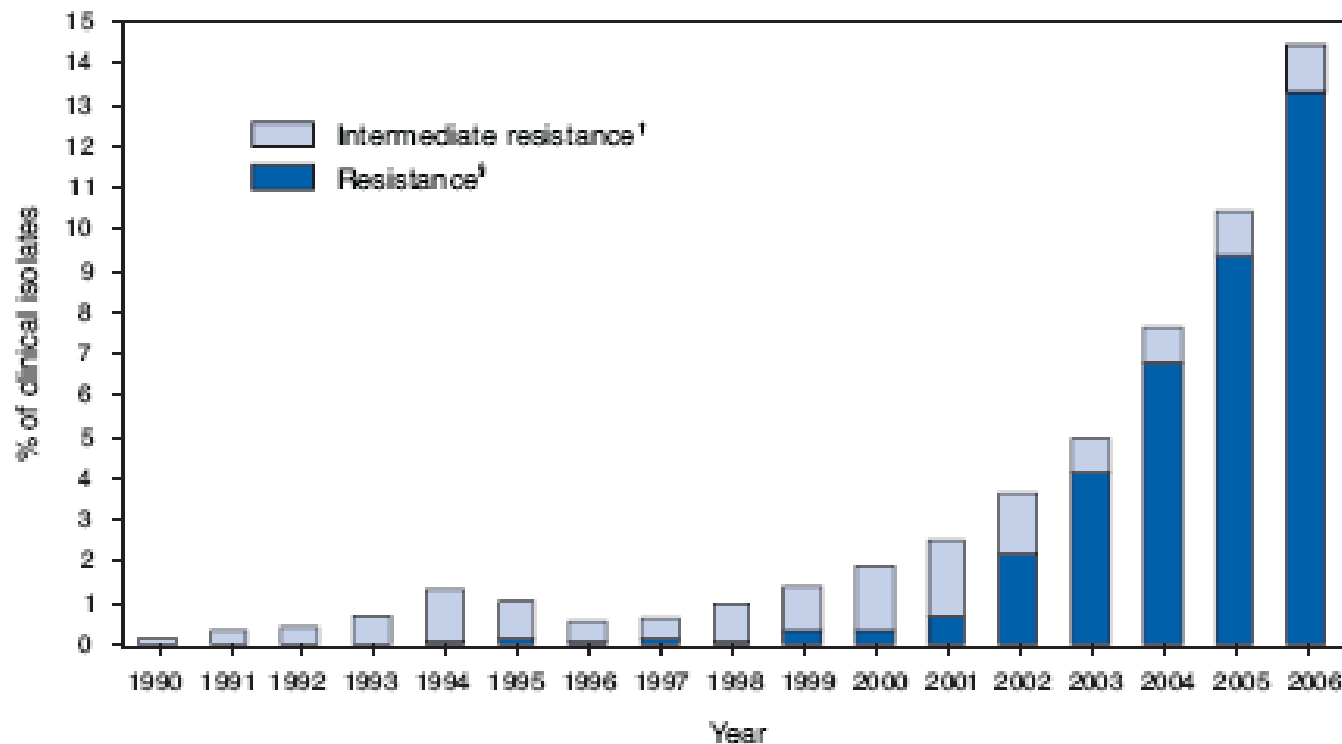
PLUS

Treatment for chlamydia if chlamydial infection is not ruled out

# Percentage of Fluoroquinolone-resistant *N. gonorrhoeae* – Hawaii, 1993-2001



**FIGURE. Percentage of *Neisseria gonorrhoeae* isolates with intermediate resistance or resistance to ciprofloxacin, by year — Gonococcal Isolate Surveillance Project, United States, 1990–2006\***



\* Data for 2006 are preliminary (January–June only).

† Demonstrating ciprofloxacin minimum inhibitory concentrations (MICs) of 0.125–0.500  $\mu\text{g/mL}$ .

‡ Demonstrating ciprofloxacin MICs of  $\geq 1.0$   $\mu\text{g/mL}$ .

# 2006 CDC STD Treatment Guidelines-Amended

## Uncomplicated Gonococcal Infections

- Recommended Regimens

**Ceftriaxone** 125 mg IM in a single dose

or

~~**Cefixime** 400 mg orally in a single dose~~

or

~~**Ciprofloxacin** 500 mg orally in a single dose~~

or

~~**Levofloxacin 250** mg orally in a single dose~~

PLUS

Treatment for chlamydia if chlamydial infection is not ruled out

# 2006 CDC STD Treatment Guidelines-Amended

## Uncomplicated Gonococcal Infections

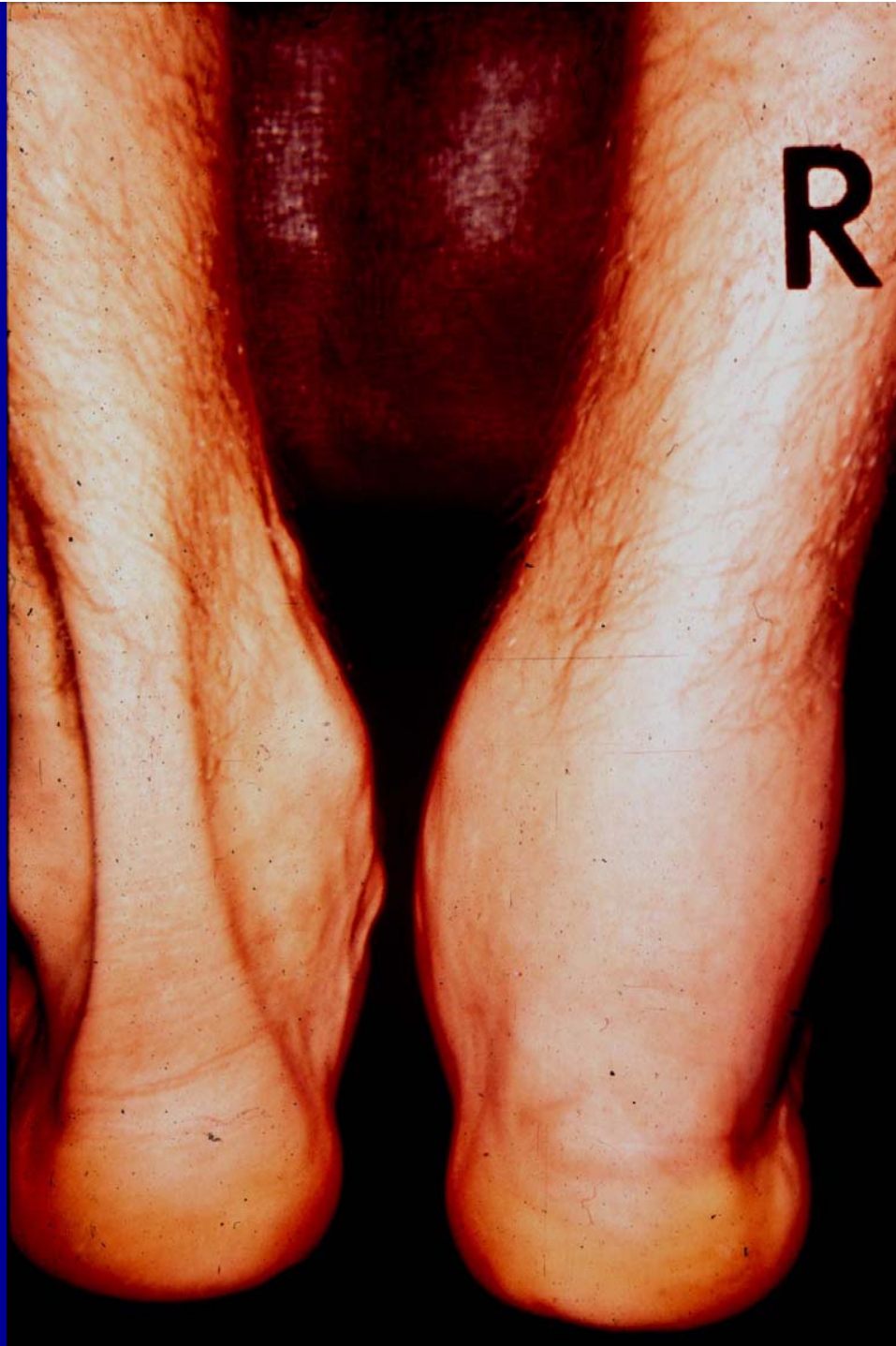
- Alternative Regimens

~~Spectinomycin 2 g IM single dose~~

Other single dose IM **Cephalosporins** (cefotaxime 500 mg, cefoxitin 2 g + probenecid, etc.)

~~Other single dose **Quinolones** (enoxacin 400 mg, lomefloxacin 400 mg, norfloxacin 800 mg)~~

Azithromycin 2 grams as a single dose/











## Culture Positivity Rates by Site in Patients With Disseminated Gonococcal Infection

Joint fluid	10-15%
Skin lesions	5-10%
Blood	
Early	50-70%
Late	20-30%
Mucosal sites	80-90%

# Laboratory Diagnosis of Disseminated Gonococcal Infection

- Gram's stain and culture of joint fluid.
- Unroof skin lesions. Swab lesion base and do Gram's stain and culture.
- Blood cultures
- Endocervical cultures in women, urethral cultures in men.
- Rectal and pharyngeal cultures in men and women. (Be sure to specify that specimen is for *N. gonorrhoeae*.)

# 2006 CDC STD Treatment Guidelines-Amended

## Disseminated Gonococcal Infection

- Recommended Regimen

**Ceftriaxone** 1 gm IM or IV every 24 hours

- Alternative Regimen

**Cefotaxime** 1 g IV every 8 hours

*For persons allergic to  $\beta$ -lactam drugs:*

~~**Ciprofloxacin** 500 mg or **ofloxacin** 400 mg IV  
every 12 hours~~

or

~~**Spectinomycin** 2 g IM every 12 hours~~

# Epidydimitis

Scrotal  
erythema



Discharge



**Rectum**

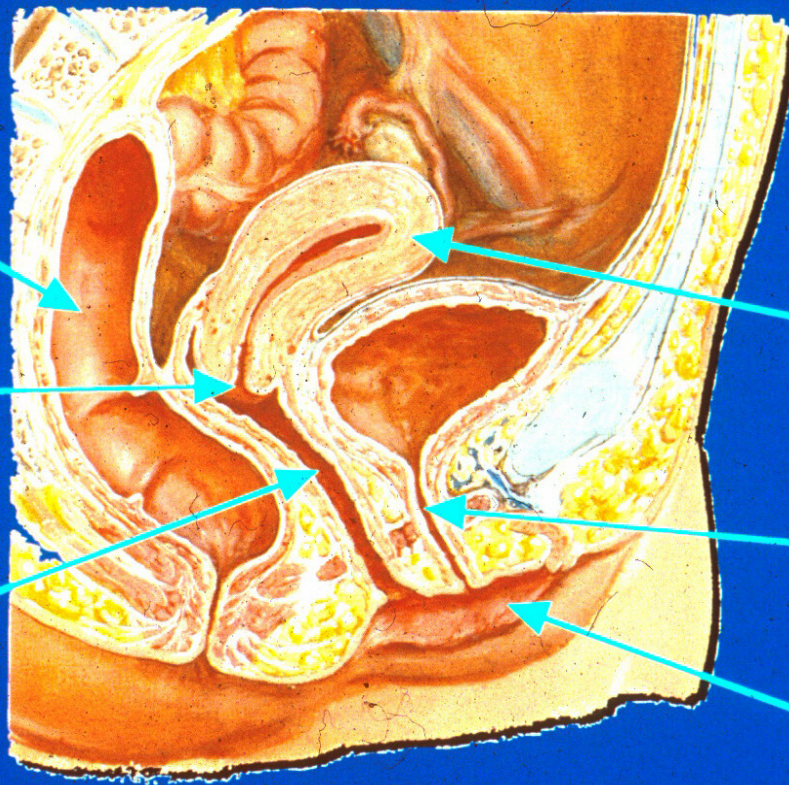
**Cervix**

**Vagina**

**Uterus**

**Urethra**

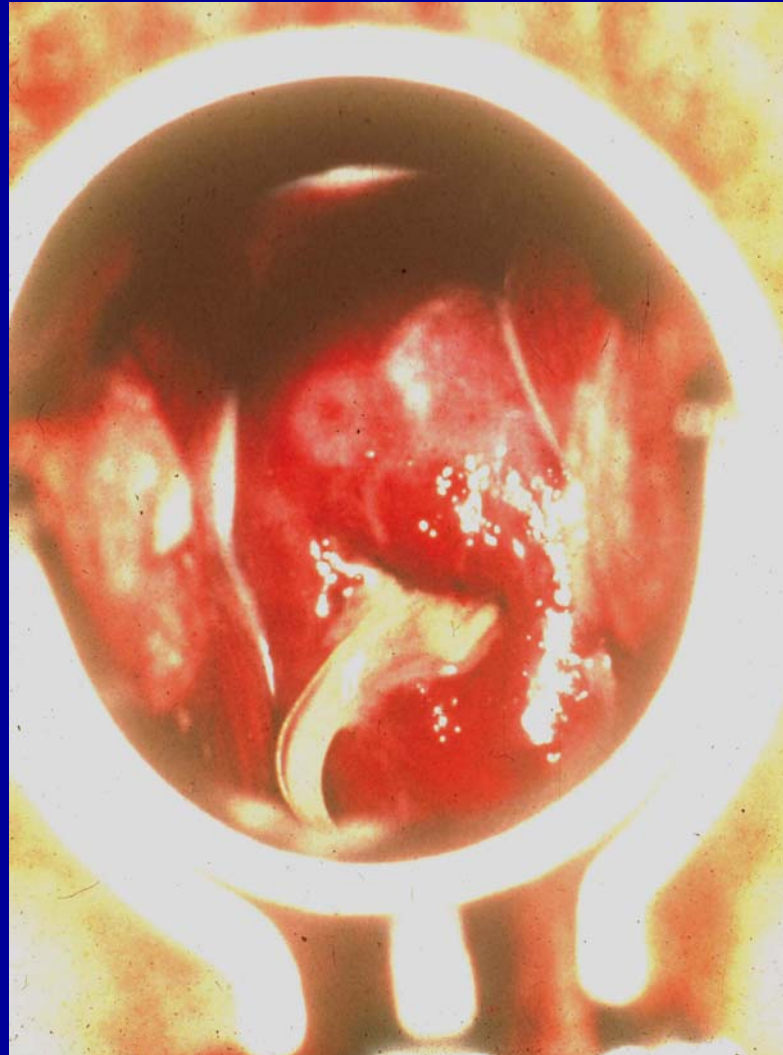
**Vulva**



# Differential Diagnosis of Vaginal Discharge

- Cervicitis
  - Chlamydia
  - Gonorrhea
  - Genital herpes
- Vaginitis
  - Candidiasis
  - Trichomoniasis
  - Bacterial vaginosis

# Gonococcal Endocervicitis





# Chlamydial Endocervicitis

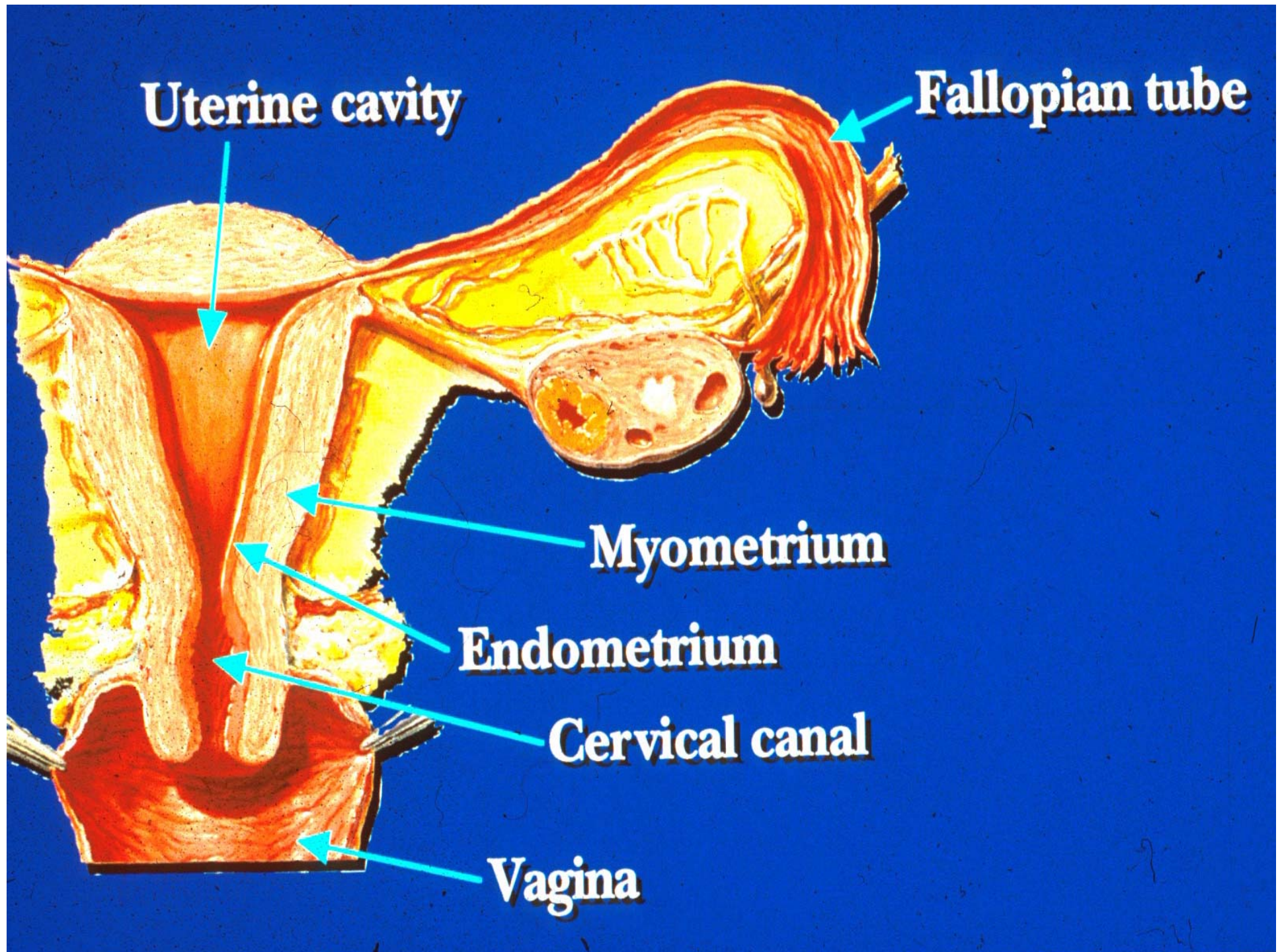




# HSV Cervicitis







# Etiology of PID

---

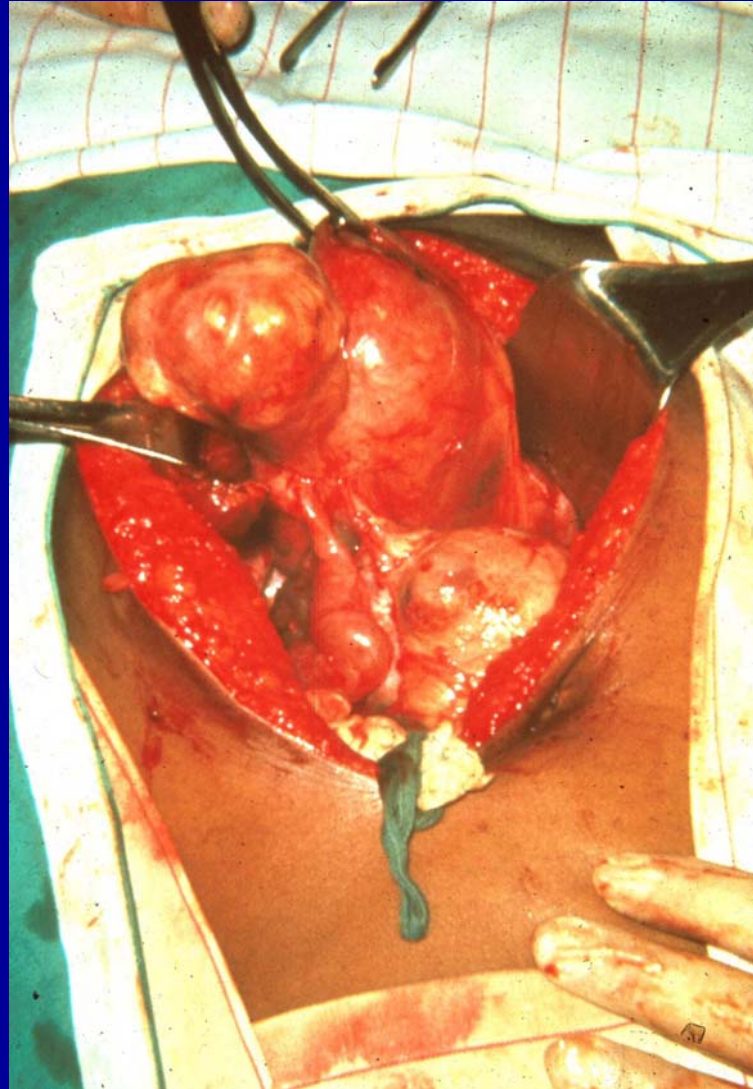
1. *N. gonorrhoeae* 20-40%

2. *C. trachomatis* 20%

3. Mixed aerobes and anaerobes  
including *Mycoplasma hominis* + *N. gonorrhoeae* 40-60%



# Ultimate Poor Outcome - Hysterectomy



# Hysterectomy Specimen



# 2006 CDC STD Treatment Guidelines

## Severe PID

- Recommended Regimen A

**Cefotetan** 2 g IV every 12 hours

or

**Cefoxitin** 2 g IV every 6 hours

PLUS

**Doxycycline** 100 mg IV or po every 12 hours

# 2006 CDC STD Treatment Guidelines

## Severe PID

- Recommended Regimen B

**Clindamycin** 900 mg IV every 8 hours

PLUS

**Gentamicin** loading dose IV or IV (2 mg/kg of body weight) followed by a maintenance dose (1.5 mg/kg) every 8 hours. Single daily dosing may be substituted

# 2006 CDC STD Treatment Guidelines

## Mild PID

- Recommended Regimen B

**Ceftriaxone** 250 mg IM once

or

Other parenteral **third-generation cephalosporin**  
(e.g., ceftizoxime, cefotaxime)

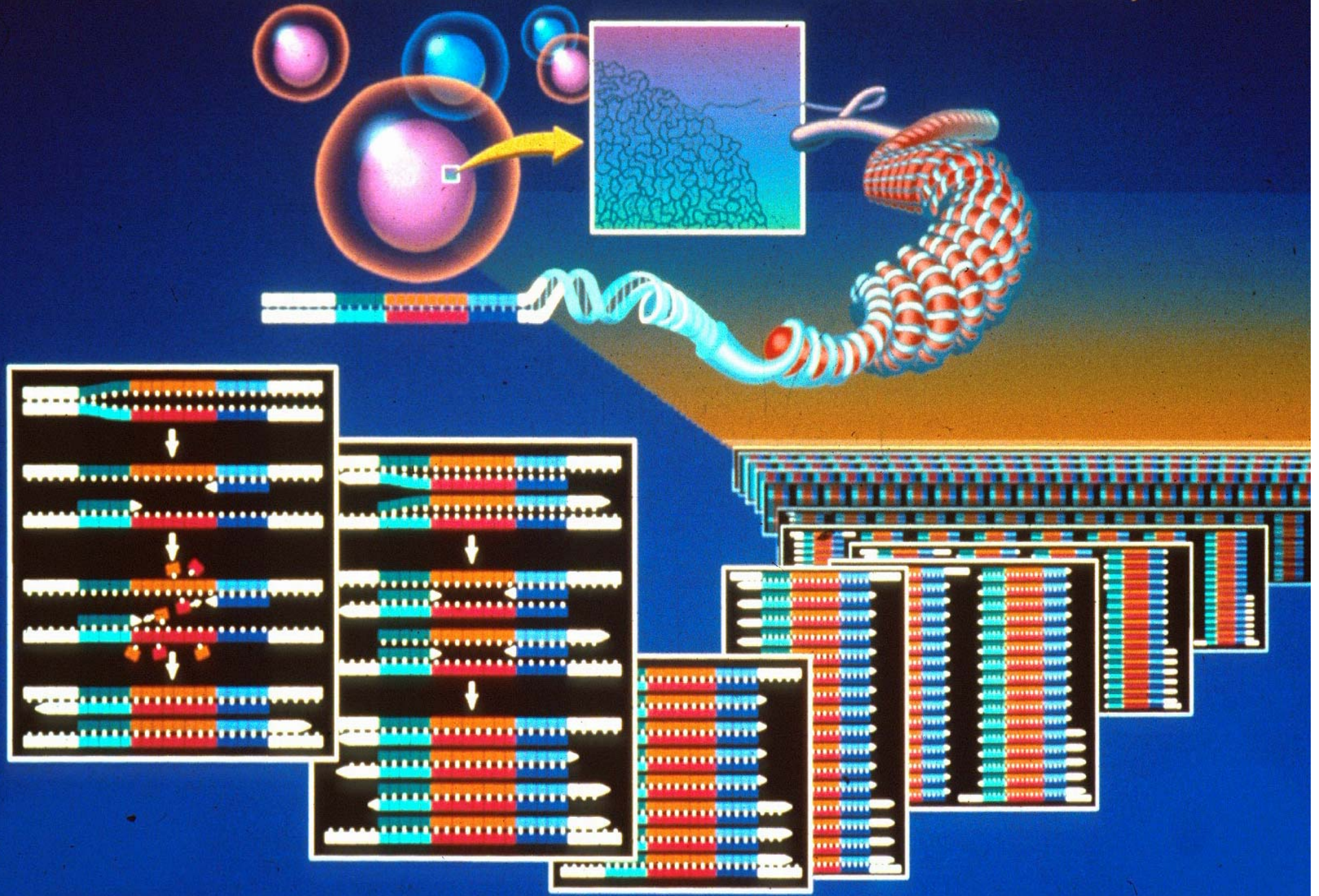
PLUS

**Doxycycline** 100 mg orally 2 times a day for 14  
days

**Metronidazole** is optional



# POLYMERASE CHAIN REACTION (PCR)



# Nucleic Acid Amplification Test (NAAT) Sensitivity for Chlamydial Infections

Assay Type	Women		Men	
	Urine	Cervix	Urine	Urethra
PCR		86%		88%
TMA		99%		96%
SDA		99%		92%

PCR-polymerase chain reaction. TMA-transcription mediated amplification.  
SDA-strand displacement amplification.

Cook RL, et al. Annals Int Med. 2005; 142: 914



## Performance of a NAAT for the Detection of *N. gonorrhoeae*

	<u>Sensitivity*</u>	<u>Specificity</u>
Endocervical	97%	99.7%
Male urethra	99%	99.9%
Female urine	96%	100%
Male urine	98%	100%

Koumans EH, et al. Clin Infect Dis 1998;27:1171.

# Take Home Messages

- *M. genitalium* is clearly associated with NGU in men. It is a likely cause relapse following doxycycline treatment.
- Quinolones are no longer recommended for treating gonorrhea in the U.S. Cefixime is back.
- Think of DGI in all patients presenting with acute asymmetrical inflammatory arthritis and obtain appropriate mucosal site cultures before starting antibiotics.
- Nucleic acid amplification tests are now the most commonly used diagnostic assays for both chlamydial and gonococcal infections