

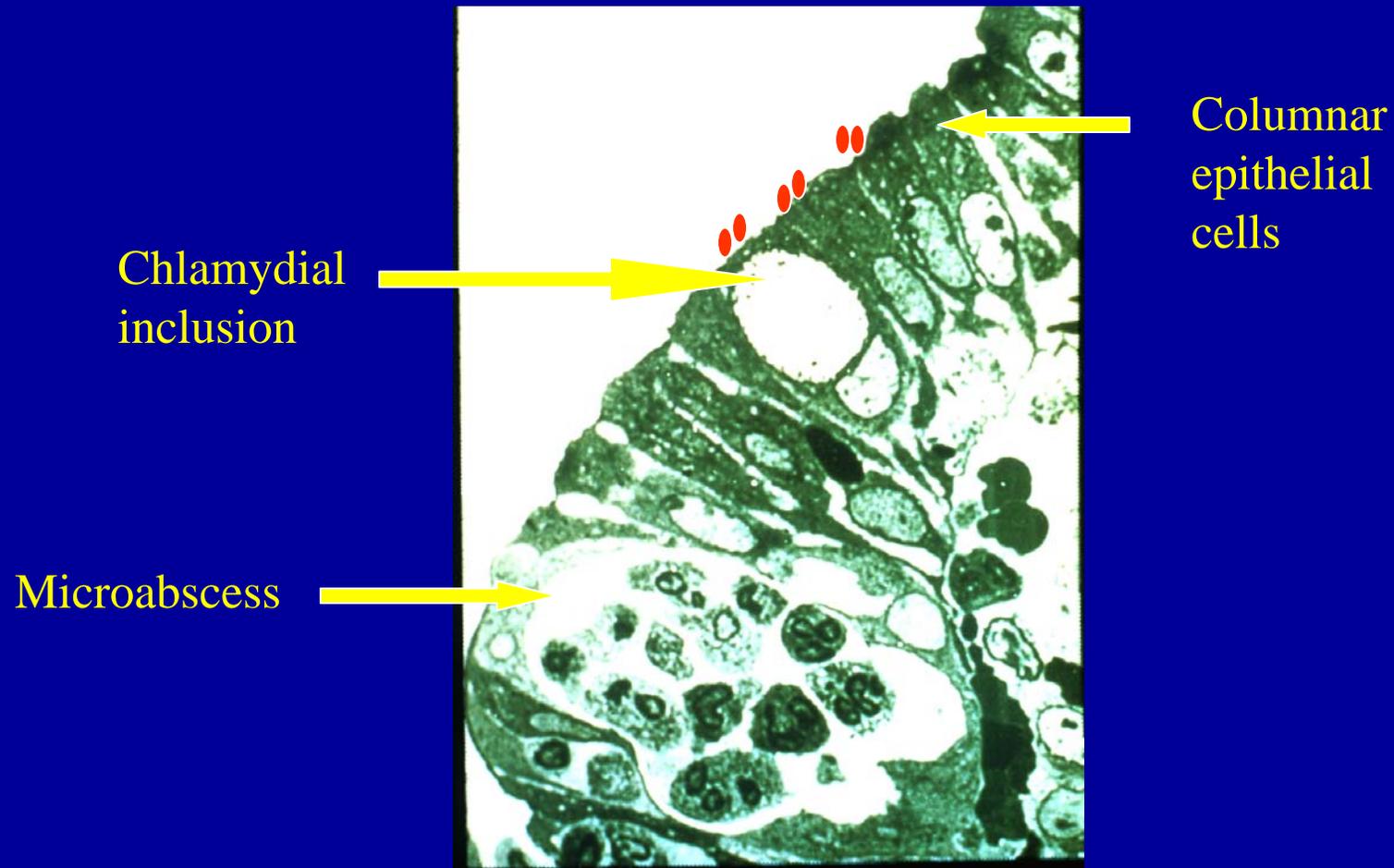
STD Update 1

Discharge Syndromes

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Electron Micrograph of a Chlamydia Infected Endocervix



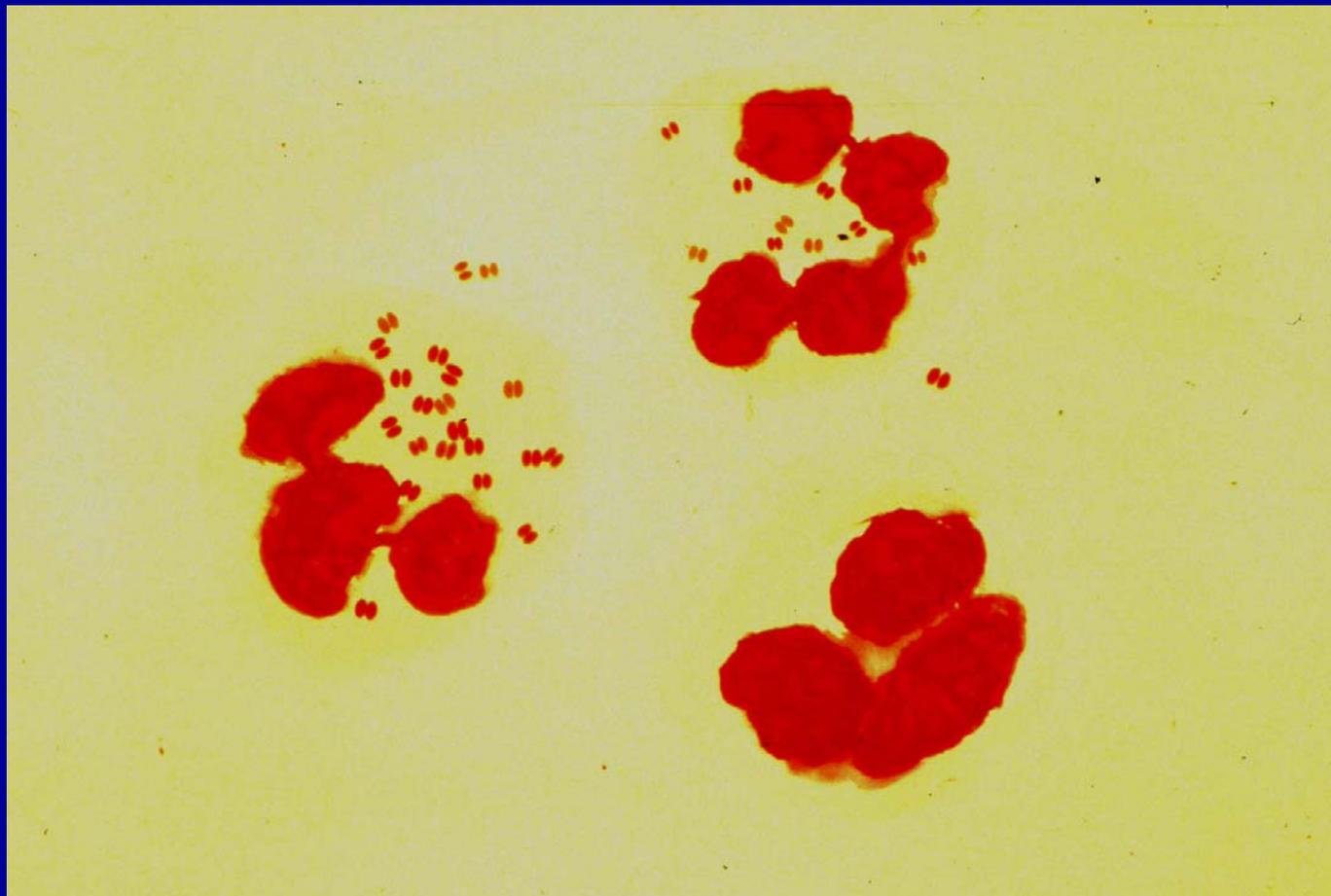
Gonococcal Urethritis



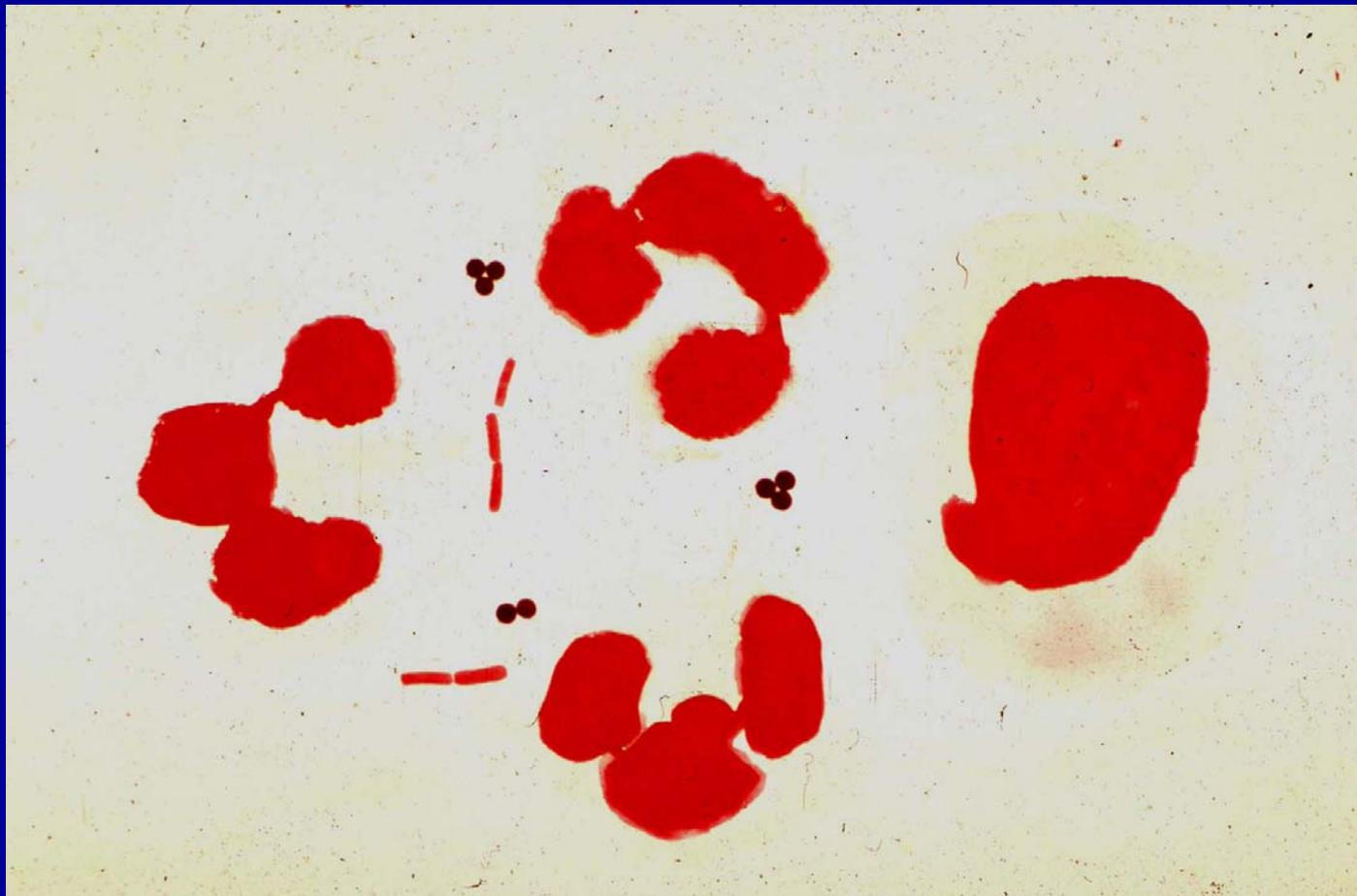
Nongonococcal Urethritis



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

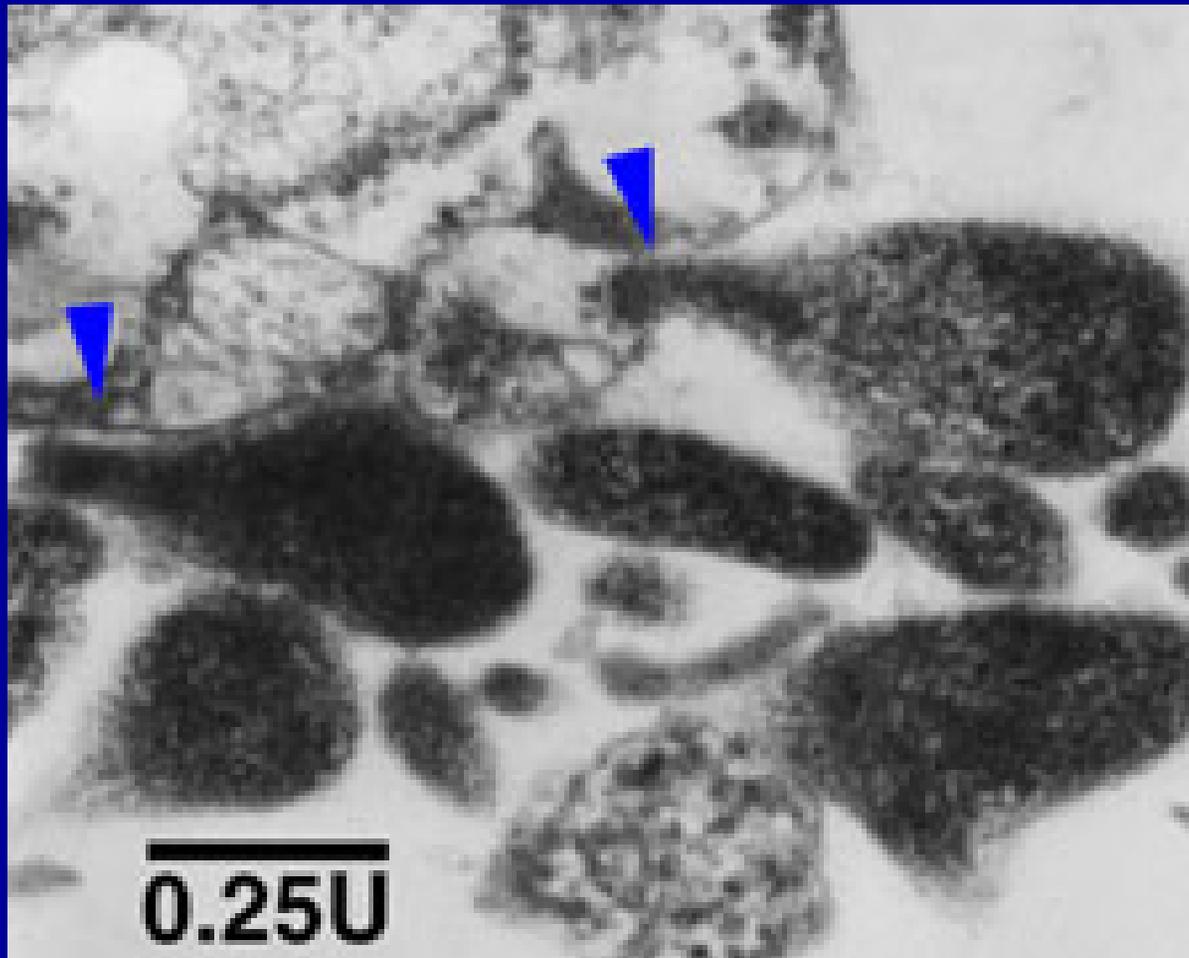
CDC STD Treatment Guidelines. MMWR 2006

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

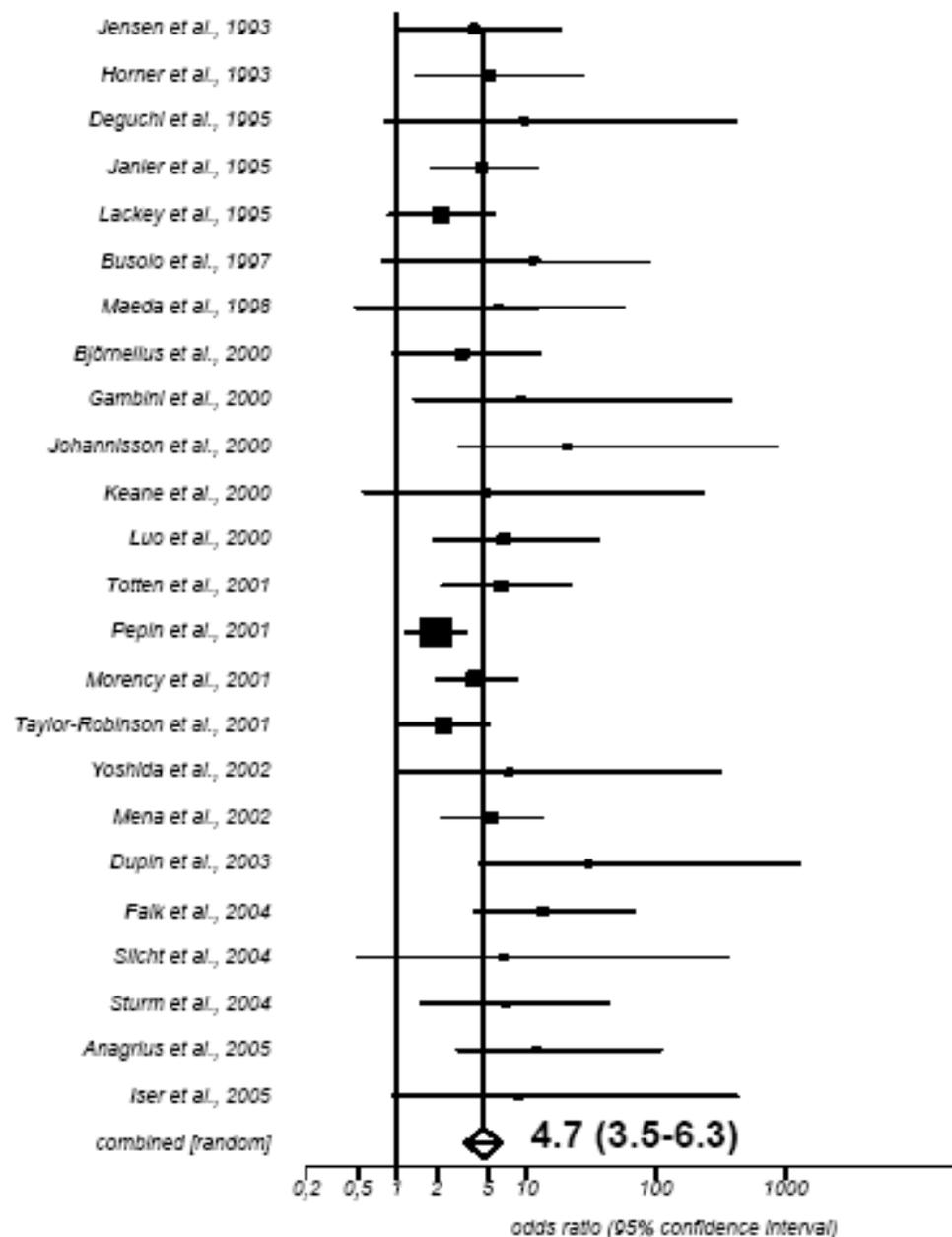
Etiology of Nongonococcal Urethritis - 2008

| | |
|-------------------------------|----------|
| <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

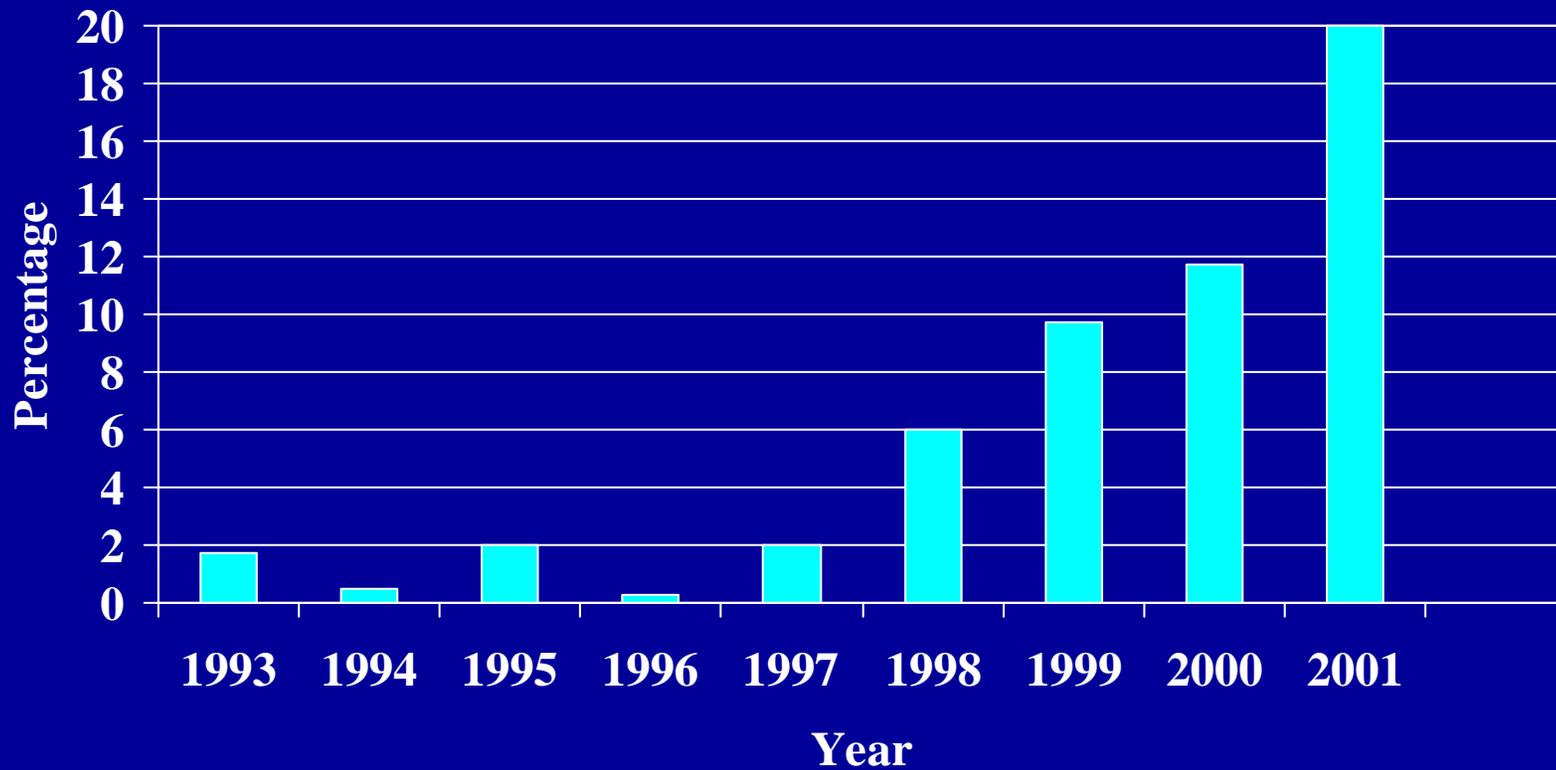
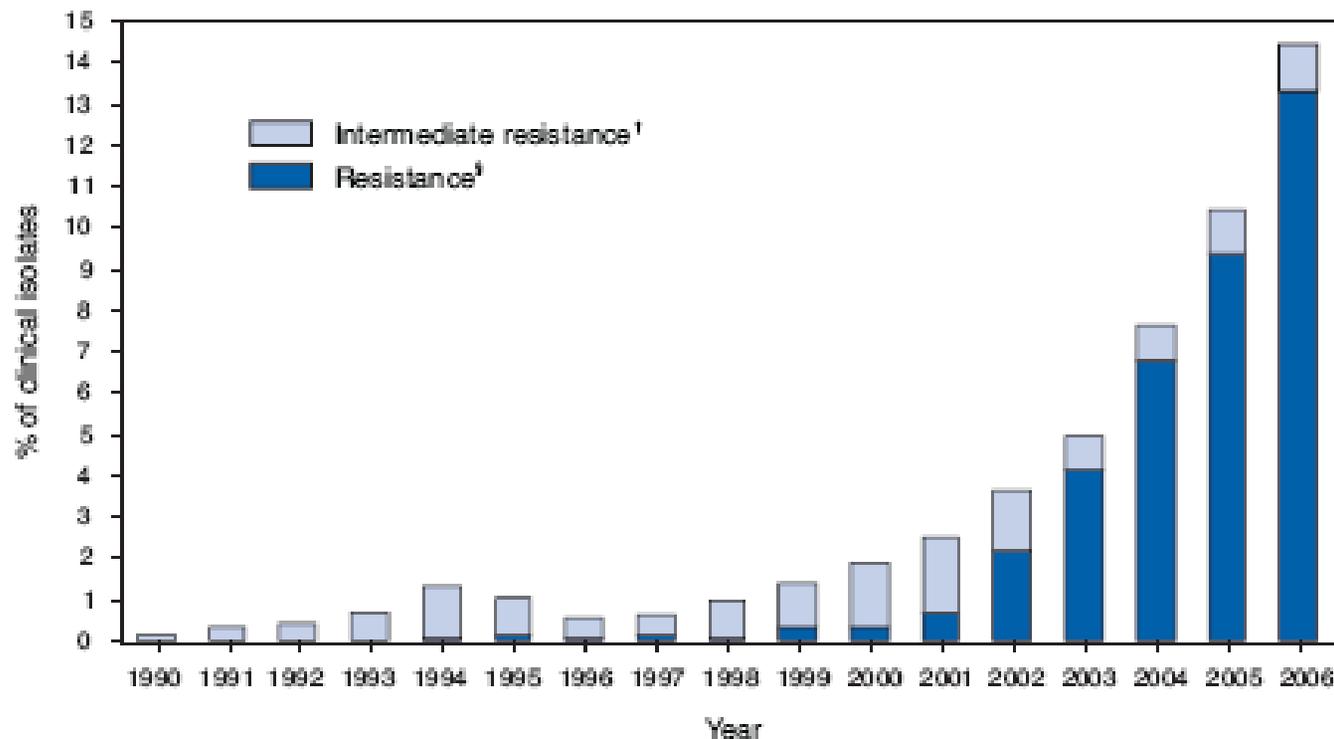


FIGURE. Percentage of *Neisseria gonorrhoeae* isolates with intermediate resistance or resistance to ciprofloxacin, by year — Gonococcal Isolate Surveillance Project, United States, 1990–2006*



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

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

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

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 β -lactam drugs:

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

or

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

Epidydimitis



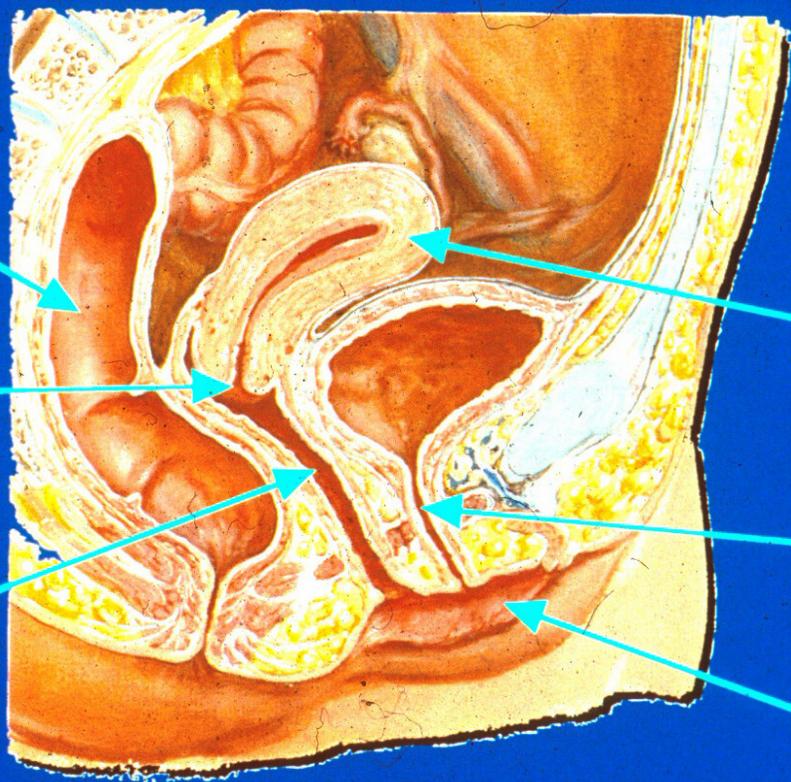
Scrotal
erythema

Discharge

Rectum

Cervix

Vagina



Uterus

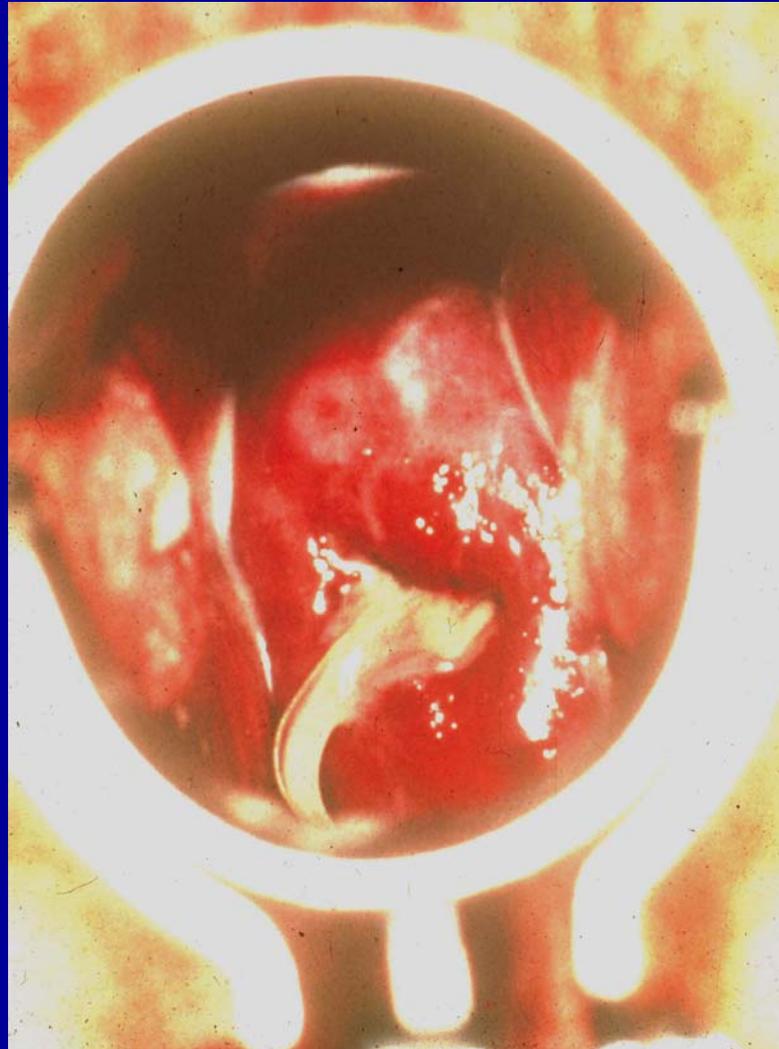
Urethra

Vulva

Differential Diagnosis of Vaginal Discharge

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

Gonococcal Endocervicitis

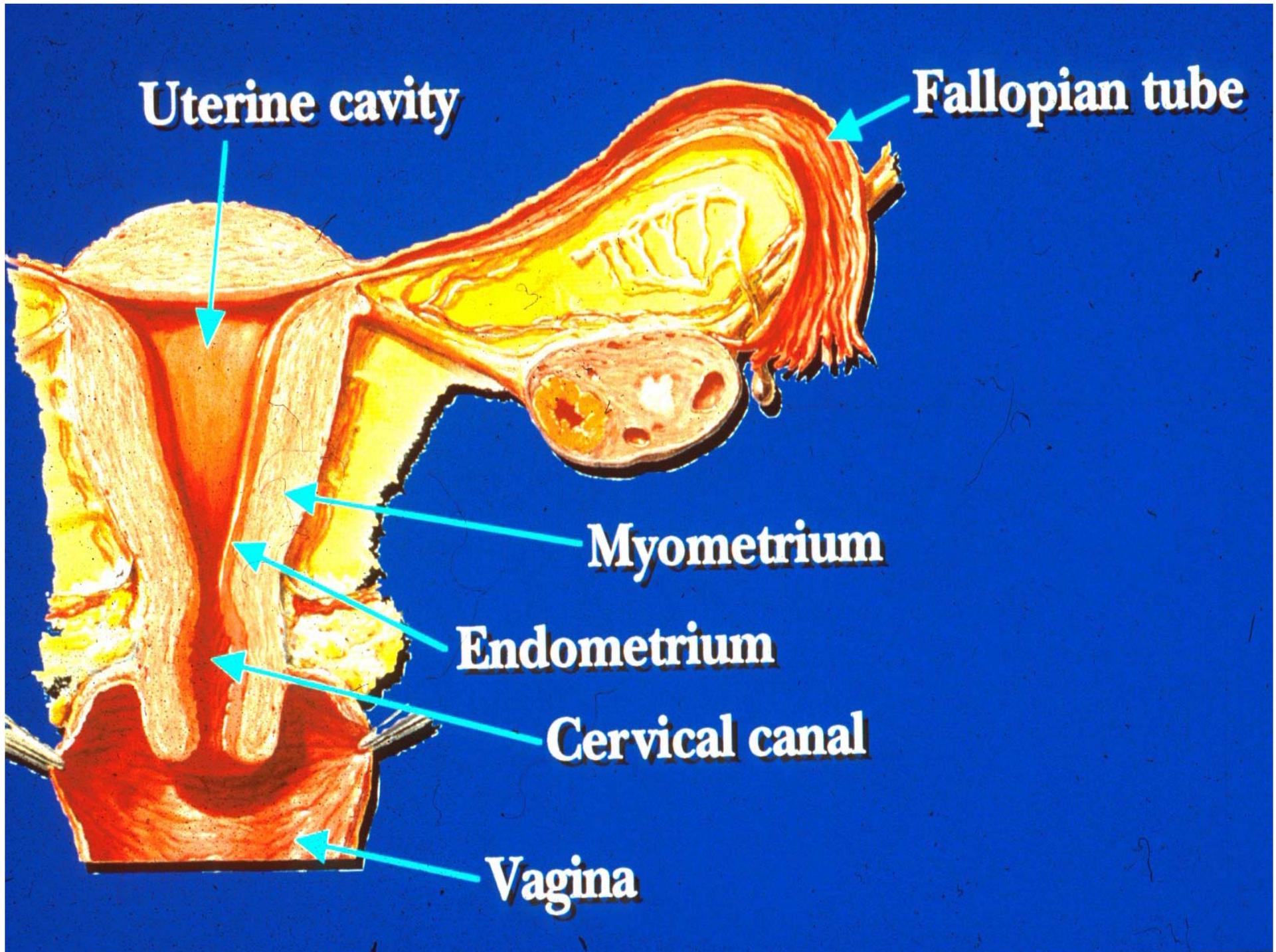


Chlamydial Endocervicitis



HSV Cervicitis

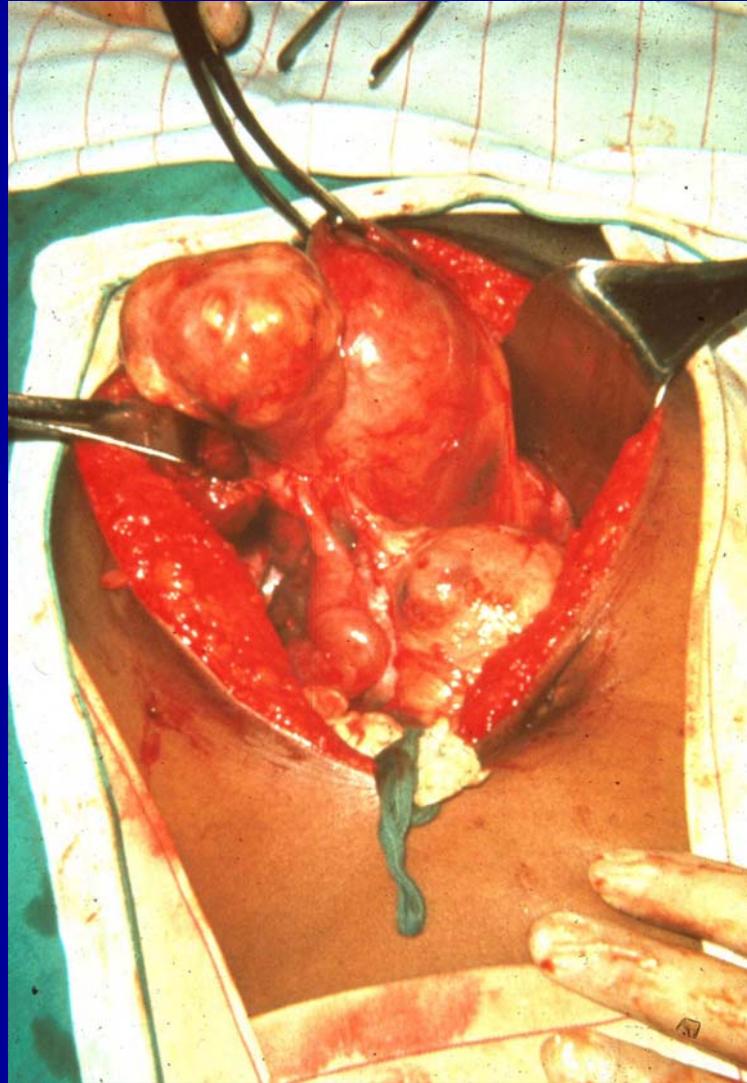




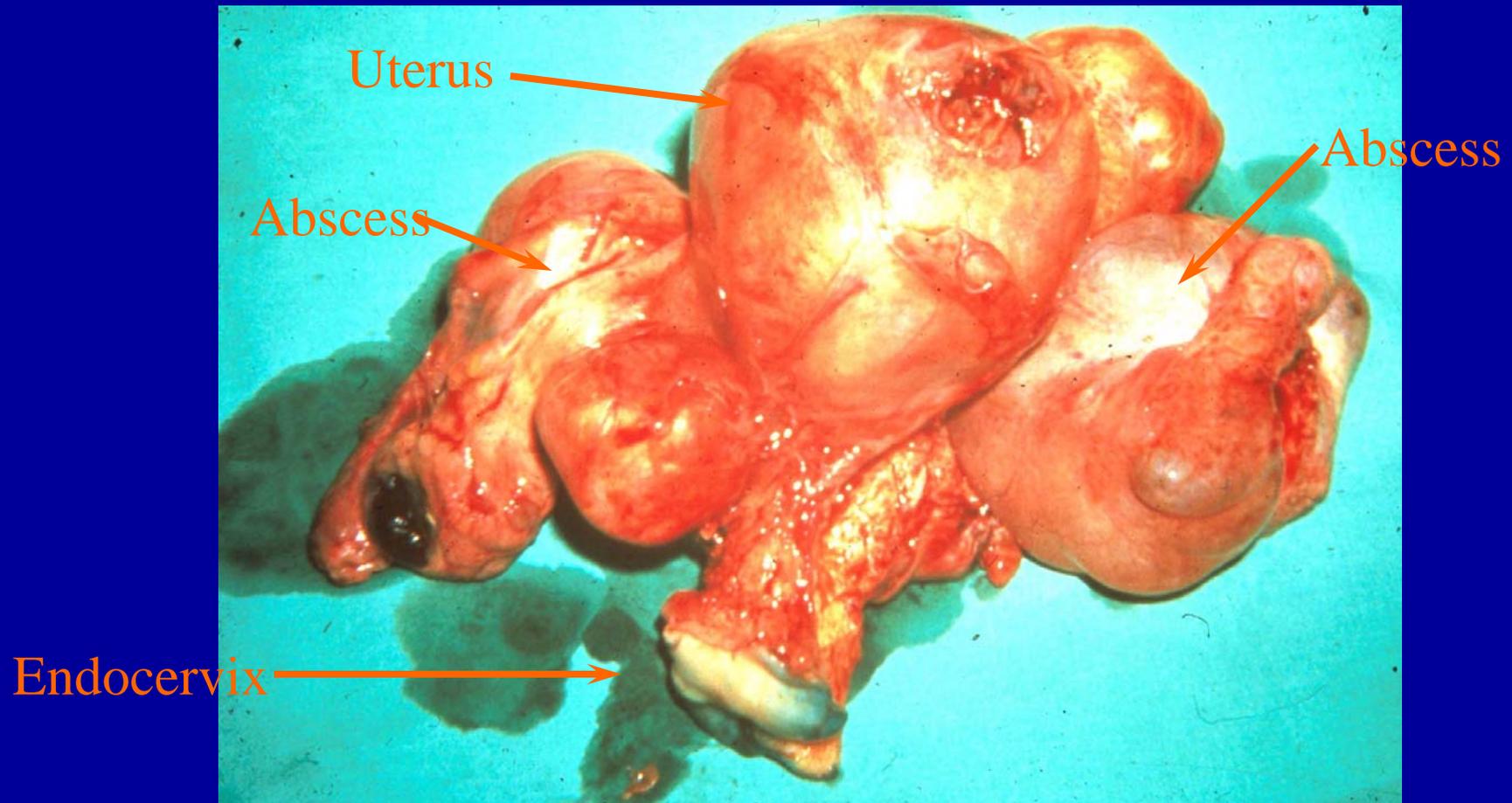
Etiology of PID

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

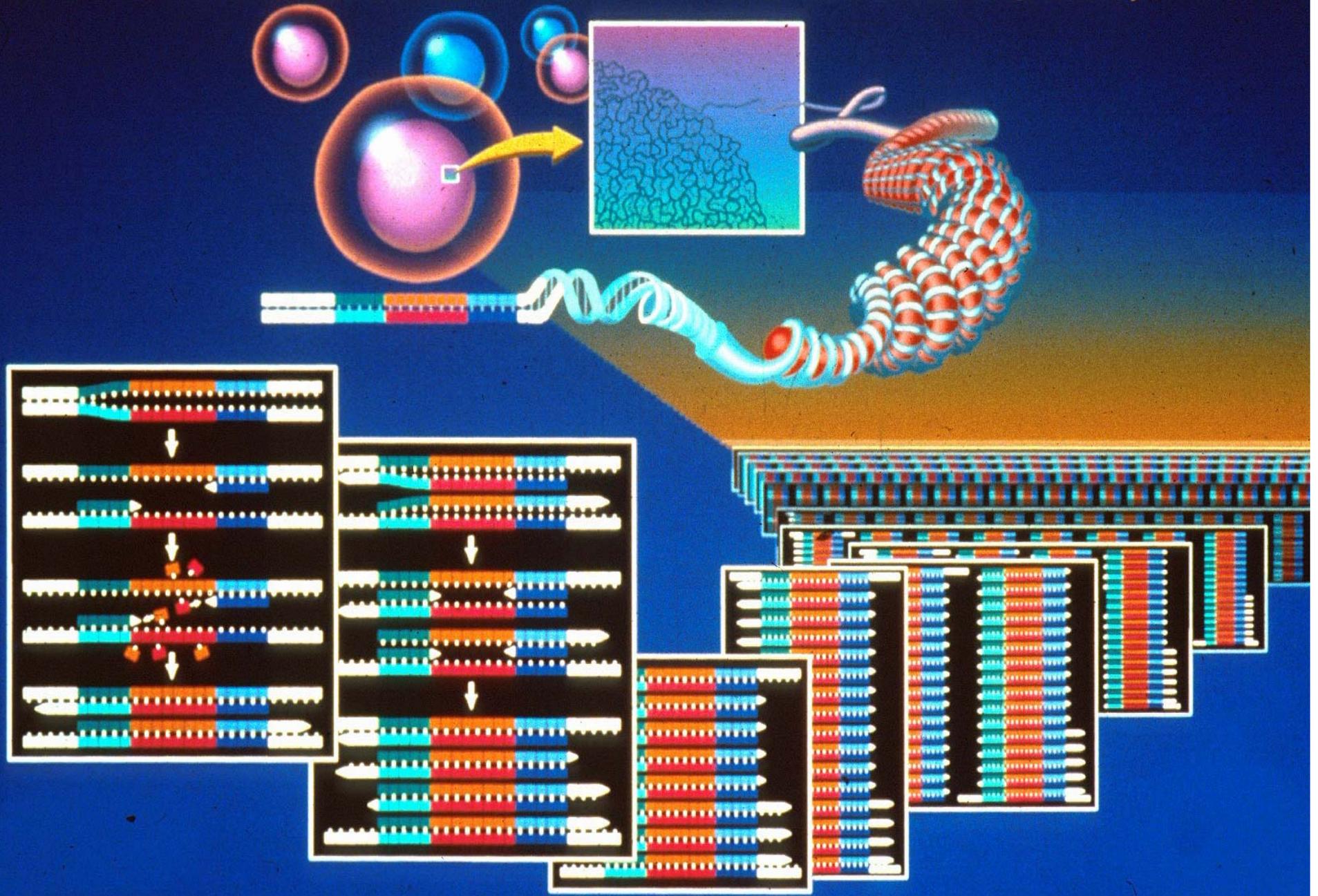
Other parenteral **third-generation cephalosporin**
(e.g., ceftizoxime, cefotaxime)

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

| <u>Assay Type</u> | Women | | Men | |
|-----------------------|--------------|--------|-------|---------|
| | <u>Urine</u> | 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