

# Cervicitis in Women Attending STD Clinics in Washington State, U.S.

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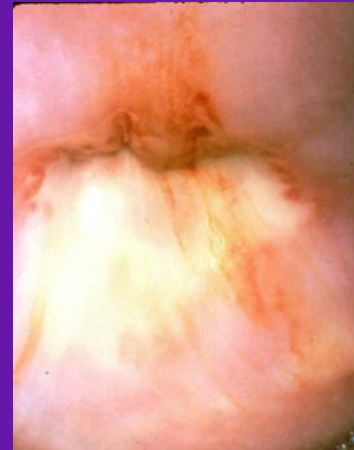
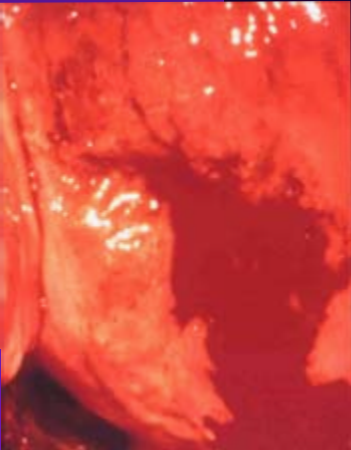
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# Background: Cervicitis

- Clinical syndrome defined by
  - Mucopurulent discharge
  - Endocervical bleeding
  - Edematous ectopy
- Etiologies: CT, GC, trichomoniasis, HSV, BV
  - Etiology detected in <40%, even with NAAT
    - No info on prevalence, risks for non-CT, non-GC cervicitis
  - ~10% of cervical CT assoc with cervicitis
    - Risks for inflammatory CT unclear



# Objectives

Among women attending STD clinics in Region 10 Infertility Prevention Project (IPP) in Washington State, U.S., 1998-2005, describe:

1. Cervicitis prevalence and proportion associated with CT defined by NAAT
2. Risks for cervicitis in women with or without CT
3. Prevalence of pelvic inflammatory disease in women with or without non-chlamydial cervicitis

# Methods

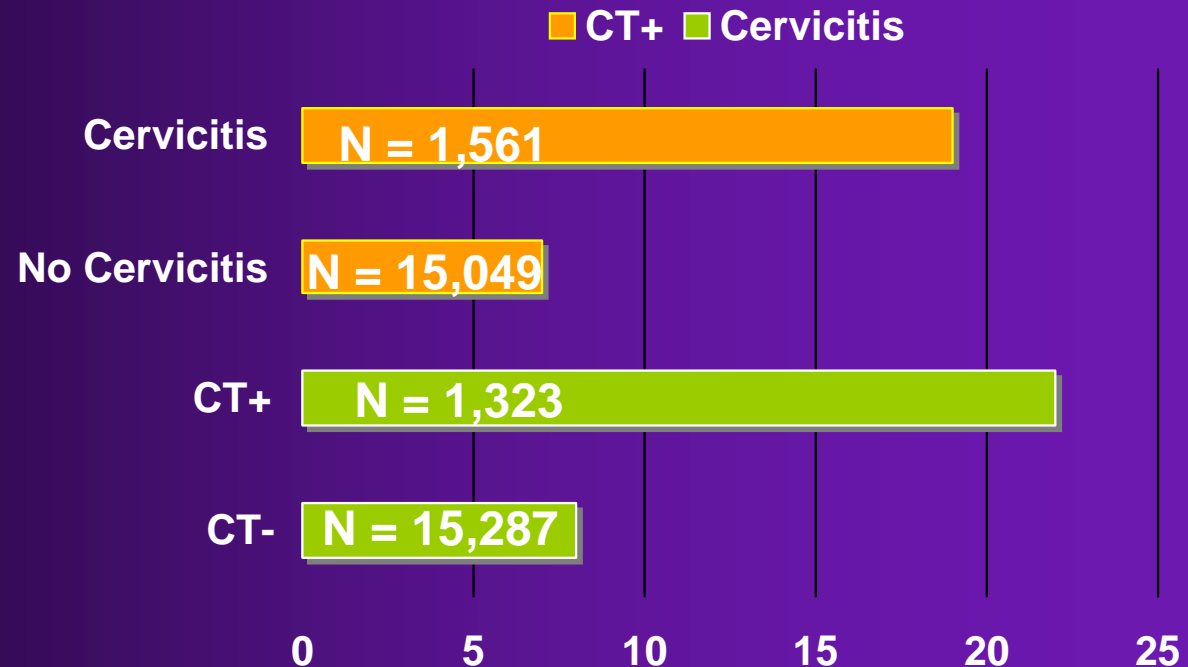
- Population: 16,610 records for women attending 18 clinics providing STD services in Washington State, January 1998 - June 2005
- Clinic inclusion:
  - STD services
  - Universal CT testing of women
  - Use of CT-NAAT for >95% of women tested
- Visits selected on basis of CT-NAAT results and record of physical exam

# Methods

- Exposures assessed:
  - Age, race, condom use last sex, CT past year
  - New or multiple partners (60 days)
  - Contact to CT
  - Symptomatic partner (urethral discharge, genital sore)
- Cervicitis: mucopurulent discharge, easily induced bleeding, and/or edematous ectopy
- PID: uterine/adnexal or cervical motion tenderness
- Chi-squared analysis, logistic regression to describe risks for cervicitis in women with and without CT ( $P < 0.05$ , two-sided)

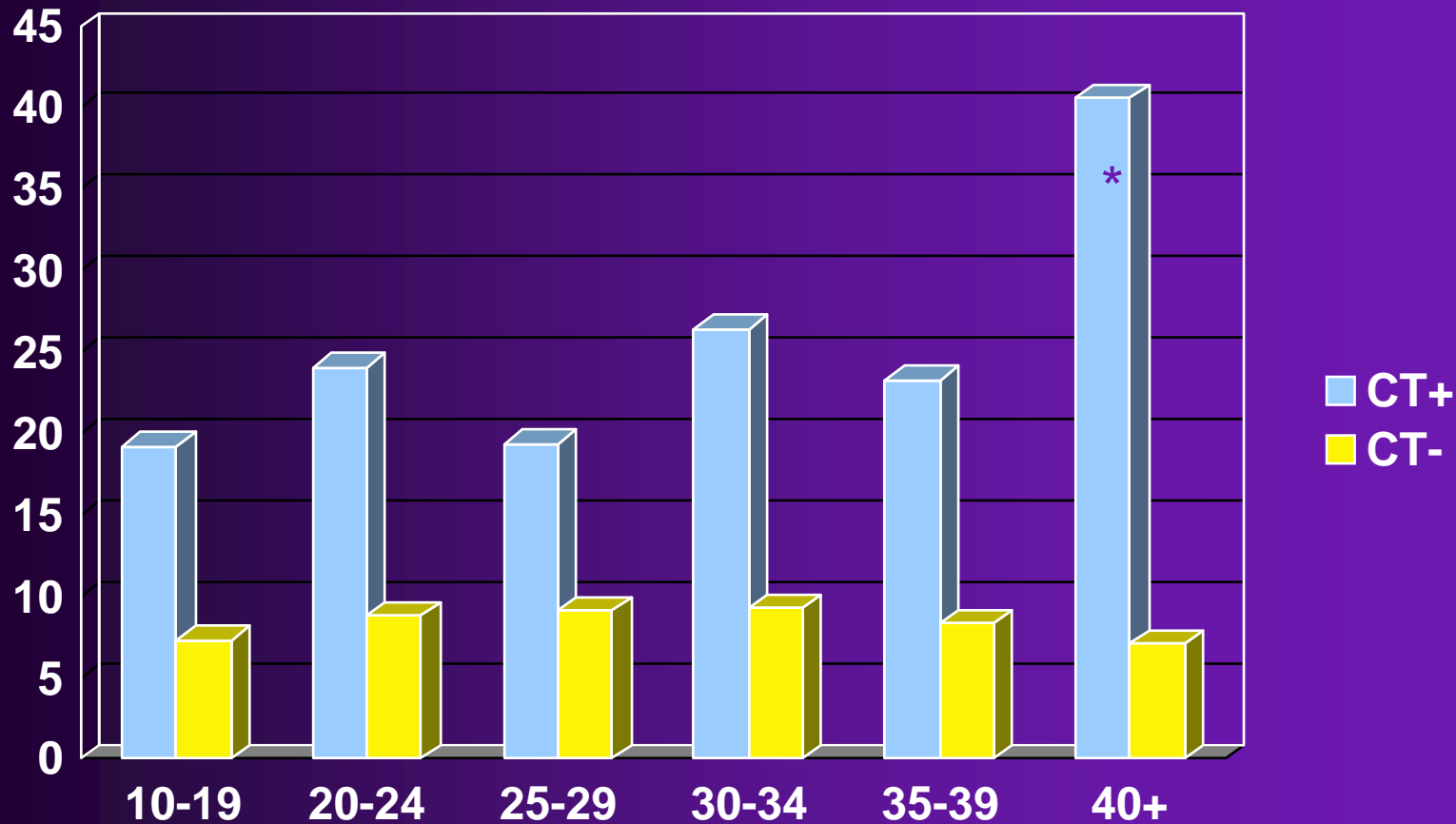
# Characteristics of Subjects

- Of 18,034 records, 1,424 (8%) excluded
- Study N = 16,610
  - Median age 25 y (range 10-72 y)
  - All Aptima-CT (GenProbe): 82% cervix, 16% urine
  - 8.0% CT+
  - 7.7% cervicitis



# Detection of CT and Prevalence of Cervicitis by Age

Cervicitis %



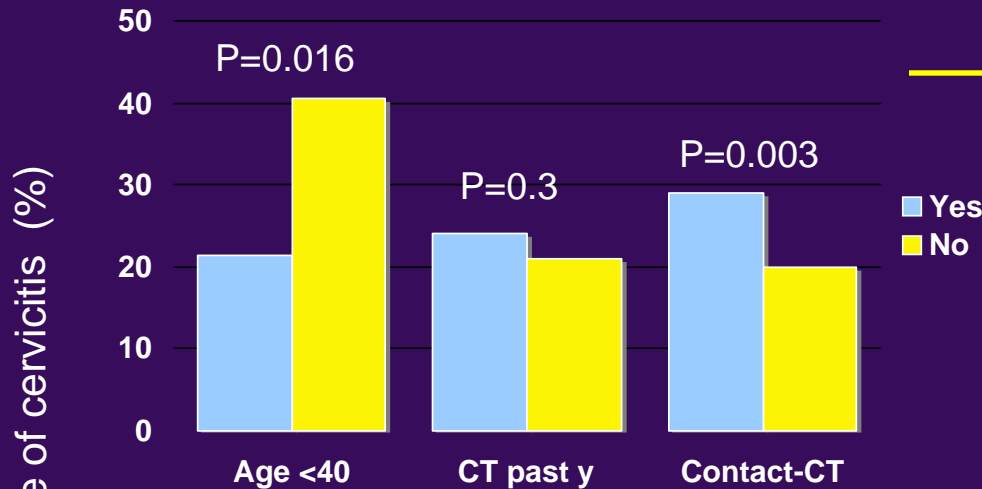
Age, y

\*P < 0.001  
trend

# Results

## Factors Associated with Cervicitis: CT+ Women (N = 1,323)

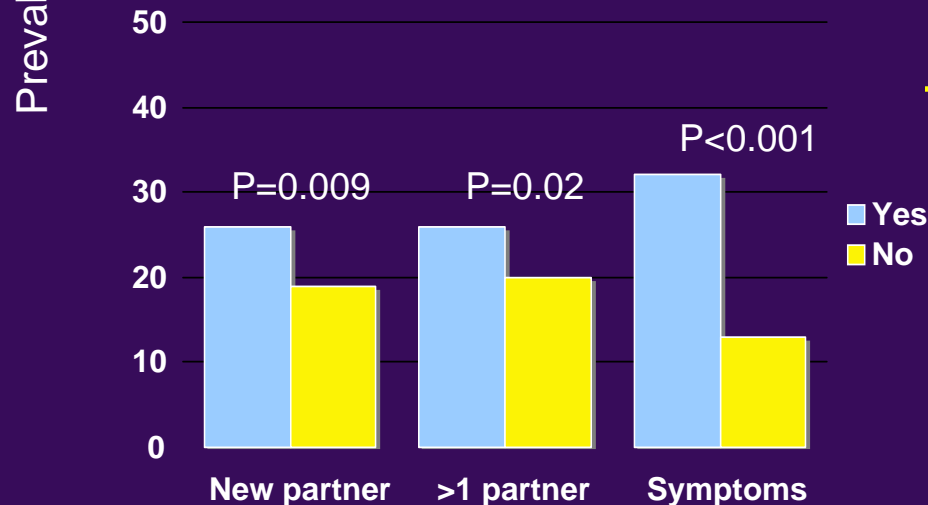
### Demographics & CT History



OR (95% CI)

|               |                 |
|---------------|-----------------|
| Age <40 y     | 0.4 (0.1, 0.8)  |
| [CT past year | 1.2 (0.8, 1.7)] |
| Contact to CT | 1.6 (1.2, 4.2)  |

### Behavioral History



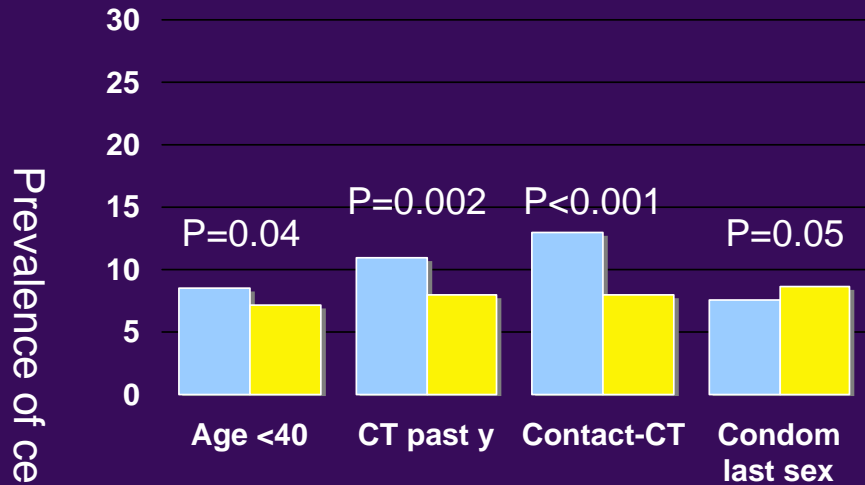
OR (95% CI)

|               |                |
|---------------|----------------|
| New partner   | 1.4 (1.1, 1.9) |
| >1 partner    | 1.4 (1.1, 1.8) |
| Partner w/ Sx | 3.0 (2.2, 4.2) |

# Results

## Factors Associated with Cervicitis: CT- Women (N = 15,287)

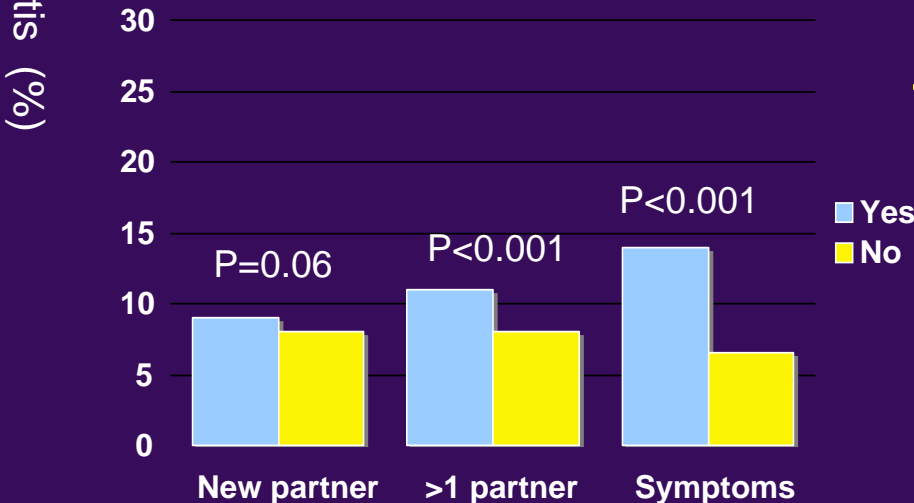
### Demographics & CT History



OR (95% CI)

|                 |                |
|-----------------|----------------|
| Age <40 y       | 1.2 (1.0, 1.4) |
| CT past year    | 1.4 (1.1, 1.7) |
| Contact to CT   | 1.7 (1.3, 2.3) |
| Condom last sex | 0.9 (0.7, 1.0) |

### Behavioral History



OR (95% CI)

|               |                |
|---------------|----------------|
| New partner   | 1.1 (1.0, 1.3) |
| >1 partner    | 1.4 (1.2, 1.6) |
| Partner w/ Sx | 2.3 (1.9, 2.8) |

# PID Among Women without CT

- Among women without CT, PID was diagnosed more often when cervicitis was present compared to when it was not:

**2.4%** of women with cervicitis

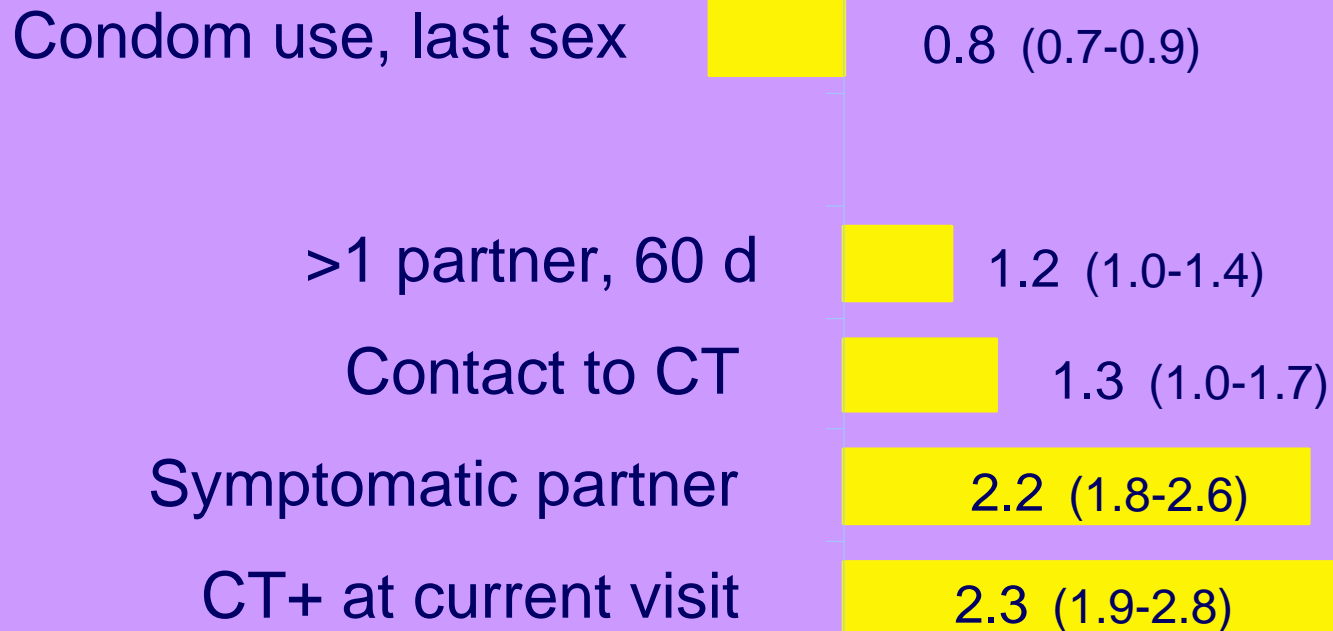
vs.

**1.1%** of women without cervicitis

OR = **2.2**  
(1.5 - 3.2)

P < 0.001

# Adjusted Risks for Cervicitis All Women (N = 16,610)



NS: age, race, CT prior year, new partner

1.0

# Validation Subset: Women with GC-NAAT Results, 2003

- 1,756 STD clinic attendees with CT-GC NAAT
- Prevalence of
  - GC: 1.14%; CT: 7.9%; Cervicitis: 11.2%

|                 | Entire group<br>(CT results only)<br>N = 16,610 | Subset<br>(GC & CT results)<br>N = 1,756 |
|-----------------|---|--|
| Condom last sex | 0.8 (0.7-0.9)                                   | 0.9 (0.63-1.37)                          |
| >1 SP (60 d)    | 1.2 (1.0-1.4)                                   | 1.1 (0.78-1.65)                          |
| Contact to CT   | 1.3 (1.0-1.7)                                   | 1.5 (0.75-2.94)                          |
| Symptoms, SP    | 2.2 (1.8-2.6)                                   | 3.2 (1.97-5.26)                          |
| Current CT+     | 2.3 (1.9-2.8)                                   | 1.6 (0.96-2.56)                          |
| Current GC+     | --  | 3.0 (1.11-8.25)                          |

# Conclusions

- In women with CT, cervicitis occurred in 22% and was associated with risks suggestive of recent acquisition (new or symptomatic partner, contact to CT)
  - Supports hypothesis that cervical inflammation may relate to factors reflecting the early period of infection (e.g., naive mucosal immune response or higher burden of CT; co-pathogens?)

# Conclusions

- Non-CT cervicitis common (10% of visits)
  - Risks differed from those for CT+ cervicitis, but still suggest recent sexual exposure (features of partner, CT contact history, reduced risk with recent condom use)
  - Conferred 2-fold increase in risk of PID diagnosis

# Limitations

- Observations recorded by many clinicians
- Clinicians might have been more likely to diagnose PID in women with cervicitis, but IPP emphasizes standardized PID diagnostic criteria
- No information on use of progesterone-based contraceptives or abnormal vaginal flora, no GC results for most
  - GC rare: 0.3% in 57,534 women tested at IPP sites in 2003 (Manhart 2007)
  - Preliminary analysis of 2003 subset suggests inclusion of GC results does not alter findings

# Acknowledgements

- Elizabeth Patrick
- Debbie Mosure

# Future Studies

- Explore potential biologic modifiers of local inflammation
  - Host: cytokine response, prior immunity
  - Organism: serovar
  - Co-pathogens complicating CT infection
- Cultivation-independent (16s rDNA) analysis applied to CT-negative cervicitis
  - Cervicitis may be associated with bacterial vaginosis
  - Role of “new” organisms