

## Gonococcal Infections

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## Outline

- A case
- Epidemiology of gonorrhea
- Clinical manifestations
- Diagnosis
- Treatment
- Partner notification

## Case

- 49 yo HIV+ male (CD4 410, HIV VL <48) presents for routine HIV f/u visit
- Reports 4 days of urethral burning.
- 3 male partners in previous 2 months.
  - HIV+ and HIV- partners; +100% disclosure
  - Receptive and insertive anal and oral sex
  - Receptive and insertive fisting
  - No condoms or gloves

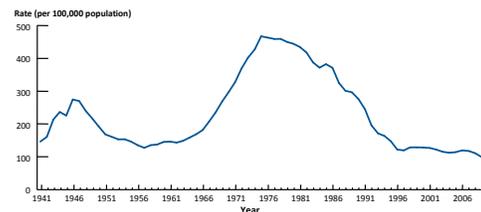
## Case continued...

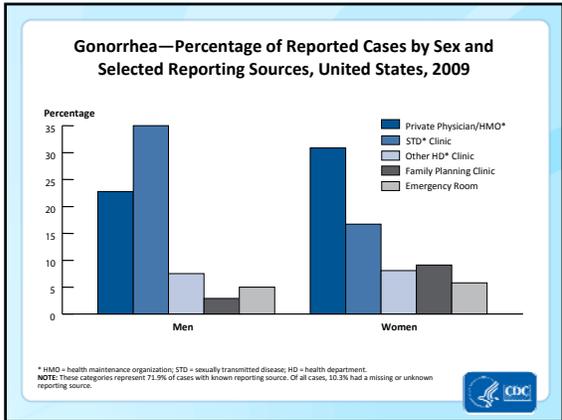
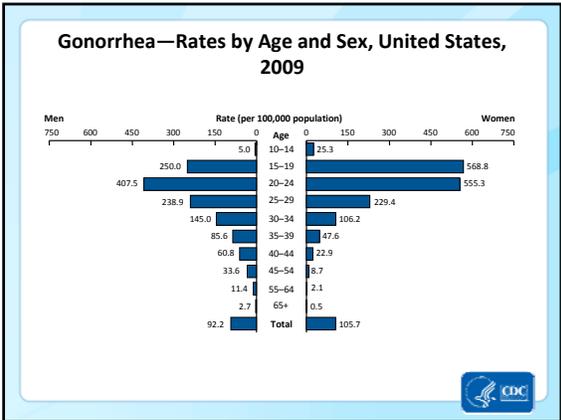
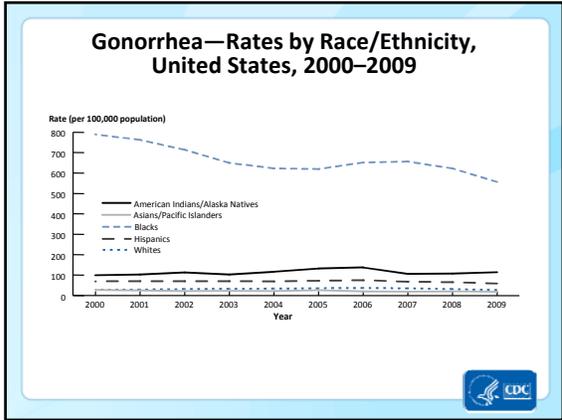
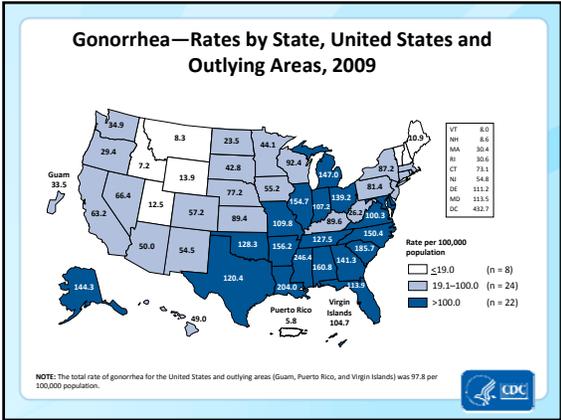
- RPR – nonreactive
- GC (pharynx) – positive
- GC (urine) – positive; CT (urine) – negative
- GC (rectum) – negative; CT (rectum) – positive
- Treatment:
  - Ceftriaxone 250mg IM x 1
  - Azithromycin 1gm po x 1

## *Neisseria gonorrhoeae*

- Gram-negative diplococcus
- Clinical manifestations described in ancient Chinese, Egyptian, Roman and Greek literature as well as in the Old Testament
- First identified in gram-stained exudates in 1879 (Neisser)
- First cultured in vitro in 1882 (Leistikow)
- First antimicrobial therapy in 1930's (sulfa)

## Gonorrhea—Rates, United States, 1941–2009





## Gonorrhea in NC

- 7,786 cases from Jan – June 2011
- Gender
  - 57% cases in females
  - 42% cases in males
- Ethnicity
  - 54% cases in black/African Americans
  - 32% cases unknown ethnicity
  - 10% cases in whites
- Age
  - 20-24 yrs olds (male and females)
- Guilford > Mecklenburg > Wake > Cumberland

## Summary of Clinical Syndromes Caused by *N. gonorrhoeae*

Men	Conjunctivitis	Penile edema
	Urethritis	Periurethral abscess
	Proctitis	Epididymitis
Women	Pharyngitis	Disseminated infection
	Conjunctivitis	Endometritis
	Urethritis	Salpingitis
	Cervicitis	Perihepatitis
	Proctitis	Disseminated infection
	Pharyngitis	
Infants	Conjunctivitis	Premature deliver
	Pharyngitis	PROM

Holmes, et al. Sexually Transmitted Diseases 2008

## Gonococcal urethritis

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- Incubation 1-14 days
- Urethral discharge and dysuria
  - Can be profuse d/c

## Gonococcal cervicitis

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- Incubation period ~ 10d
- Most common symptoms increased vaginal discharge, dysuria, intermenstrual bleeding and menorrhagia
- Exam findings – MPC vs normal

## Rectal Infection

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- Rectal site infected in 35-50% women with gonococcal cervicitis and 25-40% MSM
- Many infections asymptomatic
- Proctitis symptoms
  - Anal pruritis
  - Pus in stool
  - Rectal bleeding
  - Rectal pain
  - Tenesmus
  - Constipation

Holmes et al. Sexually Transmitted Diseases 2008

## Proctitis Evaluation and Treatment

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- Evaluate for *C. trachomatis*, *N. gonorrhoeae*, *T. pallidum* and HSV
- Treat empirically with:
  - Ceftriaxone 250mg IM x 1
  - Doxycycline 100mg po BID x 7 (?21)d
  - HSV or syphilis treatment if clinically compatible

**MOST RECTAL INFECTION ASYMPTOMATIC!!!!**

## Disseminated gonococcal infection (DGI)

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- Occurs in 0.5 – 3% of patients with GC
- Arthritis – dermatitis syndrome
  - Skin
    - "Classic" – tender, necrotic papules
    - Other appearances common
  - Arthritis
    - Arthralgias
    - Tenosynovitis
    - Frank arthritis
  - Wrists, knees, ankles, metacarpophalangeal joints most commonly affected

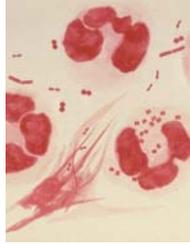
## Disseminated gonococcal infection (DGI)

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- Diagnosis
  - Cultures of blood and joints positive in < 50%
  - Cultures of "usual sites" positive in > 80%
- The diagnosis of DGI is often based on clinical suspicion and response to therapy!

## Gram stain – sensitivity (All specificities 95-100%)

- Urethra (infected)
  - Men with symptoms
    - 90-95%
  - Asymptomatic men
    - 50-70%
- Endocervix (infected)
  - Uncomplicated GC
    - 50-70%
  - PID
    - 60-70%
- Anorectum (infected)
  - Blind swabs
    - 40-60%
  - Anoscope
    - 70-80%



Holmes, et al. Sexually Transmitted Diseases 2008

## Laboratory Testing: GC

- Culture – only method to determine resistance
- Nucleic Acid Amplification Tests (NAATs)
  - NAATs amplify and detect organism-specific genomic or plasmid DNA or rRNA
- Commercially available NAATs include:
  - Becton Dickinson *BDProbeTec*<sup>®</sup>
  - Gen-Probe *AmpCT*, *Aptima*<sup>®</sup>
  - Roche *Amplicor*<sup>®</sup>
- Specimen types: urine, cervical, urethral, **VAGINAL**, liquid PAP (not as sensitive)

## NAATS for oral testing

- Oral GC testing:
  - Culture (se – 50%-65%; sp – 99.0 - 99.4%)
  - NAATS (se – 83.6-100%; sp -94.2-98.6%)
    - Gen-Probe APTIMA Combo 2<sup>®</sup>
    - BDPProbeTec<sup>™</sup> ET
- PCR not sufficiently specific for use at the oral site

Bachmann LH, Johnson RE, Cheng H, Markowitz LE, Papp JR, Hook III EW. J Clin Microbiol 2009. 47 (4): 902-907.

## NAATS - Detection of Rectal GC

- GC
  - Culture se 66.7-71.9% and sp 99.7-100%
  - PCR se 91.4-95.8% and sp 96-98.5%
  - SDA se 97.1-100% and sp 96-98.8%
  - TMA se 100% and sp 95.5-98.3%

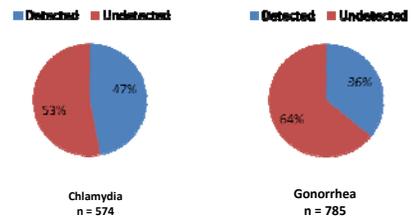
Bachmann LH, Johnson RE, Cheng H, Markowitz LE, Papp JR, Palella FJ, Hook III EW. J Clin Microbiol May 2010

## Gonococcal Infection by Site

Site(s) positive	No. (%)
Genital <sup>a</sup> and oral <sup>b</sup> sites positive	23 (28.0)
Genital site only positive	28 (34.1)
Oral site only positive	31 (37.8)
Total genital or oral sites positive	82 (100.0)

Bachmann LH, Johnson RE, Cheng H, Markowitz LE, Papp JR, Hook III EW. J Clin Microbiol 2009. 47 (4): 902-907.

## Proportion of Chlamydial and Gonococcal Infections That Would Not Be Identified if Only Urine/Urethral Screening Performed Among Gay/Bisexual Men: San Francisco – 2003

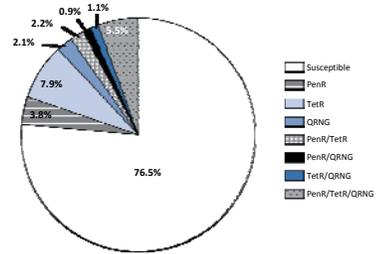


Kent et al. CID 2005

## Treatment of *N. gonorrhoeae*: A history

- Prior to mid-1930's
  - urethral irrigation
- Mid-1930's to mid-1940's
  - sulfanilamide
- Mid-1940's to late 1980's
  - PCN, tetra, macrolides
- 1980's
  - spectinomycin, cephalo
- 1990's to 2007
  - quinolones, cephalo
- 2007 to now
  - cephalosporins

## Gonococcal Isolate Surveillance Project (GISP)—Penicillin, Tetracycline, and Ciprofloxacin Resistance Among GISP Isolates, 2009



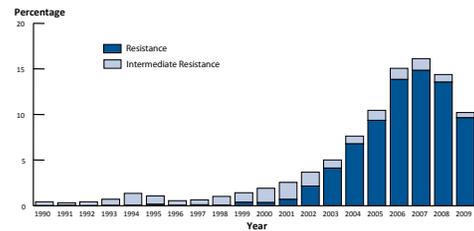
NOTE: PenR = penicillinase producing *Neisseria gonorrhoeae* and chromosomally mediated penicillin-resistant *N. gonorrhoeae*; TetrR = chromosomally and plasmid mediated tetracycline-resistant *N. gonorrhoeae*; and QRNG = quinolone-resistant *N. gonorrhoeae*.



## Gonococcal Isolate Surveillance Project (GISP)—Location of Participating Sentinel Sites and Regional Laboratories, United States, 2009



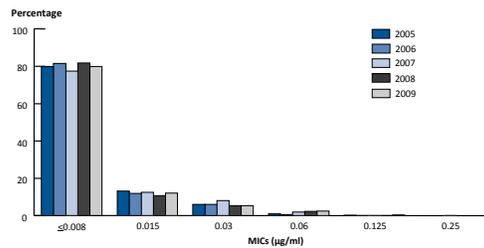
## Gonococcal Isolate Surveillance Project (GISP)—Percentage of *Neisseria gonorrhoeae* Isolates with Resistance or Intermediate Resistance to Ciprofloxacin, 1990–2009



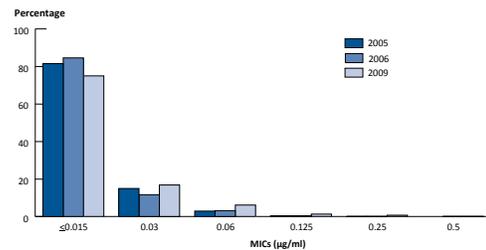
NOTE: Resistant isolates have ciprofloxacin minimum inhibitory concentrations (MICs) >1 µg/ml. Isolates with intermediate resistance have ciprofloxacin MICs of 0.125–0.5 µg/ml. Susceptibility to ciprofloxacin was first measured in GISP in 1990.



## Gonococcal Isolate Surveillance Project (GISP)—Distribution of Minimum Inhibitory Concentrations (MICs) to Ceftriaxone Among GISP Isolates, 2005–2009



## Gonococcal Isolate Surveillance Project (GISP)—Distribution of Minimum Inhibitory Concentrations (MICs) to Cefixime Among GISP Isolates, 2005–2006 and 2009



NOTE: Isolates were not tested for cefixime susceptibility in 2007 and 2008.



### 2010 STD Treatment Guidelines: Gonorrhea

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- Recommended
  - Ceftriaxone 250 mg IM or **IF NOT AN OPTION...**
  - Cefixime 400 mg PO or
  - Single-dose injectible **cephalosporin** regimens
- Plus (even if chlamydia test negative)
  - Azithromycin 1gm po x 1 or
  - Doxycycline 100mg po BID x 7d

### Resistant Gonorrhea

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- If cephalosporin treatment failure
  - ID Consult
  - GC susceptibility testing
  - 250 mg IM – 1gm IM ceftriaxone
  - Ensure partner treatment
  - Report to state and CDC

### Partner Management

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- Sex partners should be evaluated, tested, and treated if they had sexual contact with the patient during the 60 days preceding the onset of symptoms or diagnosis of chlamydia or gonorrhea.
- The most recent sex partner should be evaluated and treated even if the time of the last sexual contact was >60 days before symptom onset or diagnosis.
- ?Expedited partner therapy