Sexually Transmitted Infections in Adolescents

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- I do not intend to discuss an unapproved/investigative use of commercial
Learning Objectives

- To learn the signs and symptoms of sexually transmitted infections in adolescents
- To understand the changes to the Center for Disease Control STD Treatment Guidelines
- To learn the correct billing mechanisms for assessment, testing and treatment of adolescents for STI while preserving confidentiality

Sexual Behaviors of US High School Students 2009 Youth Risk Behavior Survey

- Ever Had Sexual Intercourse: 46.0
- Did Not Use a Condom at Last Sex: 38.9
- Had Sex Before Age 13: 5.9
- Used Drugs/Alcohol at Last Sex: 21.5
- Had 4 or More Sexual Partners: 11.8
Adolescent Sexual Health Trends

- National Youth Risk Behavior Surveillance System
  - ↓ in high school students who have ever had sex
    - 1991-2009: ↓ 54% to → 46%
  - ↓ in high school students reporting sex with ≥4 persons
    - 1991-2009: ↓ 19% → 14%
  - Used condom during last sexual intercourse
    - 1991-2003: ↑ 46% → 63%
    - 2003-09: no significant change, still ~ 61%

Adolescent Susceptibility to STIs

- Physical
  - Cervical ectopy
  - Asymptomatic nature of infection
  - No prior immunity

- Cognitive
  - Concrete thinking
  - Not planning ahead
  - Unable to judge risk for STI
  - Invincibility
Adolescent Susceptibility to STIs

- Behavioral
  - Early sexual initiation
  - Sexual activity with a new partner
  - Multiple partners
  - Substance use at last sex

- Social
  - Lack of insurance/ability to pay
  - Lack of “medical home”
  - Confidential services

CDC 2010 STD Treatment Guidelines

- Update the 2006 Guidelines
  - Scientific, evidence-based process

- Advise health-care providers on
  - Most effective STI treatment, screening, prevention and vaccination

- Recommendations developed
  - Consultation with public/private sector professionals knowledgeable in STD management

www.cdc.gov/std/treatment
Case 1: “I Need a Physical to Play High School Tennis”

- Jane is a 16 year old girl who comes to your office for a sports physical. She recently became sexually active with her 16 year old boyfriend of a year. They use condoms “all the time.” He had one prior sexual partner, a female who is in the same grade. Ashley is asymptomatic. She does not want her parents to know she is sexually active.

Approach to the Adolescent

Key Strategies

- Assess developmental level
- Discuss confidentiality with adolescent/parent
- Appropriately ensure confidentiality, time alone
- Brief risk assessment at most visits
- STI screening annually if sexually active
- Systems for follow-up of confidential results
Confidentiality

- Information about teen’s treatment not disclosed without his/her permission
- Supported by national organizations
  - Expert consensus: (ACOG ’88, AAFP ’89, AAP ’89 SAHM ’92, AMA’92)
- Determined by age/developmental level
- Need to establish caveats when presenting to teens and parent/guardian

Confidentiality and STI*

- All 50 states and the District of Columbia allow minors to consent to STD services
- 11 states require that a minor be a certain age (12 or 14) to consent.
- 31 states include HIV in package of STI services to which minors may consent
- 18 states allow physicians to inform parents that a minor is seeking or receiving STI services

*www.guttmacher.org/statecenter/adolescents.html
**Involving Parents/Guardians**

- Lay groundwork for confidential relationship when child is pre-teen
- Introduce concept of time alone at 11 year old visit
- Encourage parental participation in care & support of confidentiality
- Have materials such as posters/brochures available

**Exceptions to the Provision of Confidential Health Services**

- Suspected physical, sexual or emotional abuse
- At risk for harm to self or others
- May confidentially report certain STIs to health department
  - Chlamydia
  - Gonorrhea
  - HIV
  - Syphilis
How can I perform chlamydia screening confidentially?

Confidentiality and Billing

- Cannot guarantee confidentiality
- Health plan may send explanation of benefits (EOB) to parent revealing confidential services performed
- Need to know the “paper trail issues” in your health system
- Need to figure out a way to work within these limitations
- Know alternatives-Medicaid Family Planning Benefit, Planned Parenthood, local clinics
Confidentiality and Follow-up

- Always get alternative phone numbers
- May wish alternative address
- Email
  - Must consider lack of confidentiality over Internet
- Caveats when establishing confidentiality

According to Bright Futures, Which STD Should Jane Be Tested For?

A) Chlamydia only
B) Chlamydia and gonorrhea
C) Chlamydia, gonorrhea, and syphilis
D) Chlamydia, gonorrhea, and HIV
E) Chlamydia, gonorrhea, syphilis and HIV
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http://www.cdc.gov/std/stats09/slides.htm
### Chlamydia—Positivity Among Women Aged 15–24 Years Tested in Family Planning Clinics, by State, Infertility Prevention Project, United States and Outlying Areas, 2009

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**NOTE:** Includes states and outlying areas that reported chlamydia positivity data on at least 500 women aged 15–24 years who were screened during 2009.

http://www.cdc.gov/std/stats09/slides.htm

### Why Screen for STIs?

- **Standard of care**
- **Cost effective**
- Reduces transmission/prevents complications (PID, infertility)
- **HEDIS Measure-Chlamydia screening females <25 years**
What Makes a Patient High Risk for STI?

- 2 biggest risk factors
  - Young age
  - Previous STI
  - Previous Pregnancy
- Other factors to consider
  - New partner since last test
  - Multiple partners
  - Erratic/improper condom use

AAP Bright Futures
STI Screening Adolescents

- Chlamydia and gonorrhea screen
  - Tests appropriate to the patient population and clinical setting
    - No gender preference
- Offer HIV and syphilis testing based on:
  - Clinical setting: STI Clinic, correctional facility, homeless shelter, TB clinic, MSM clinic, clinic prevalence >1% population served
  - STI risk factors:
    - Unprotected sex with > 1 partner
    - Ever been treated for STI
    - Use or ever use intravenous drugs
    - MSM
    - Trades sex for money/partner has ever
Bright Futures
STI Prevention via Immunization

- Human Papillomavirus Vaccines
  - ACIP/AAP recommended for females, 9-26 years
  - More effective if initiated prior to sexual activity
  - Bivalent (HPV2)* – cervical cancer and intraepithelial lesions
  - Quadrivalent (HPV 4)** – genital warts; cervical cancer and intraepithelial lesions; anal cancer and intraepithelial lesions; approved by FDA for boys

- Hepatitis B Vaccine
- Hepatitis A Vaccine

*HPV 6, 11, 16, 18
**HPV 6, 11, 16, 18

Other National Standards

- Centers for Disease Control 2010 Guidelines

- Health Plan Employer Data and Information Set (HEDIS)
  - Screen all women 16-20 years for chlamydia

- U.S. Preventive Services Task Force (USPSTF)*
  - Recommends screening for chlamydial infection for all sexually active non-pregnant young women aged 24 and younger
  - Grade A Recommendation

http://www.uspreventiveservicestaskforce.org/uspstf/uspschlm.htm
Chlamydia Screening

- Most common treatable STI in 15-19 year olds 2761/100,000
- Usually asymptomatic
- Associated with significant pathology
- Screening “high risk” only females misses significant number of infections
- Should be done every 6 months in high females
- Cost effective at population level
- Decreases PID by 60%

Which of the following types of tests is most sensitive for diagnosing Chlamydia?

A) Culture
B) Nucleic acid amplification tests (NAATs) (PCR, TMA)
C) Antigen detection tests (ELISA, EIA, DFA)
D) Non-amplified DNA probe
Which of the following types of tests is most sensitive for diagnosing Chlamydia?

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Tests: Nucleic Acid Amplification Test (NAAT)

- Amplified nucleic acid sequences specific to organism being detected  
- Do not require viable organisms  
- Most sensitive chlamydia tests-90-95%  
- Endocervical, urethral, urine, and self collected vaginal swab specimens  
  - Vaginal swab most sensitive  
  - Urine recommended for boys
Urine Testing

- “First void” urine used for testing for chlamydia and gonorrhea
- Best for asymptomatic or symptomatic boys
- Best for asymptomatic screening in girls
  - Convenience
  - Sensitivity approaches endocervical testing for chlamydia but somewhat lower for gonorrhea

“First Void” Urine Collection How To.....

- At least one hour since last void
- Do NOT clean with antiseptic wipes
- Collect first 10cc of urine in sterile cup
- Void the rest in toilet
- If need urine culture:
  - Wipe after first 10cc void
Case 1: Sports Physical-Follow Up

- Jane screens positive for chlamydia and is not infected with gonorrhea or HIV
- How do you proceed?

Chlamydial Cervicitis

- No change in treatment standards
  - Azithromycin 1g po
  - Doxycycline 100mg po bid x 7d
- Do not recommend test of cure unless symptoms persist, compliance questioned, or reinfection suspected
- Re-screen in 3-4 months after treatment
Pediatrician’s Role to Prevent Repeat Infection

- Partner notification
- Patient informs partner
  - Provider counsels patient about informing partner
  - Form letter
  - Resources for evaluation/treatment
  - Expedited partner therapy (EPT)

Expedited Partner Therapy

Treatment of sex partners without a prior health care provider exam or assessment
EPT
Patient-Delivered Partner Therapy

- In New York State
- Write prescription for EPT

EPT Implementation

- EPT Rx should be accompanied by instructions
  - appropriate warnings about taking medications if pregnant
  - general health counseling
  - advise that partners should seek medical evaluations, particularly with STD or PID symptoms
## Clinical Syndromes Caused by *C. trachomatis*<sup>*</sup>

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*<http://www2.cdc.gov/stdtraining/ready-to-use/chlamydia.htm>*

## PID Diagnostic Criteria<sup>*</sup>

- One or more of the following:
  - Cervical motion tenderness
  - Uterine tenderness
  - Adnexal tenderness (uni-or bilateral)
- PLUS
- One of the following
  - Temperature > 38 C
  - Mucopurulent discharge
  - >5 WBC/HPF on discharge
  - Elevated ESR
  - Elevated C-reactive protein
  - Laboratory evidence of GC or Chlamydia in endocervix
- >5 WBC/HPF on discharge

*<http://www.cdc.gov/std/treatment/2010>
Fitz-Hugh Curtis
Peri-hepatitis

- Right upper quadrant abdominal pain
- May have lower quadrant pain
- May have cervical motion tenderness
- Normal liver function tests
- Elevated ESR/C-reactive protein
- Generally, positive test for chlamydia/gonorrhea

CDC Recommended Treatment of Salpingitis/Peri-hepatitis

- **Recommended Inpatient Regimen A**
  - Cefotetan 2 g IV every 12 hours
  - OR
  - Cefoxitin 2 g IV every 6 hours
  - PLUS
  - Doxycycline 100 mg orally or IV every 12 hours

- **Recommended Outpatient Regimen**
  - Ceftriaxone 250 mg IM in a single dose
  - PLUS
  - Doxycycline 100 mg orally twice a day for 14 days
  - WITH or WITHOUT
  - Metronidazole 500 mg orally twice a day for 14 days
- **Must re-assess in 72 hours**

*For other inpatient regimens, go to http://www.cdc.gov/std/treatment/2010/psd.htm
CDC Recommended Treatment of Epididymitis

- Ceftriaxone 250 mg IM in a single dose
- Doxycycline 100 mg orally twice a day for 10 days

Rectal and Pharyngeal Chlamydia and Gonorrhea

- CDC recommends NAATs for detection of rectal and pharyngeal infections
- Rectal and pharyngeal specimen types not been cleared by the FDA for use with NAATs
- Labs encouraged to establish their own specifications
- Quest and LabCorps sites now offer NAAT testing for rectal and pharyngeal CT and GC
Case 2: Burning on Urination

- Joey is a 17 year old sexually active boy who has had "burning on urination" for the last five days. He has no penile discharge.

Urethritis

- Mostly asymptomatic
- Present with dysuria and/or purulent discharge
- Chlamydia and gonorrhea most commonly identified but NAATs very often negative
- Evaluation
  - Genital examination
  - Leukocyte esterase in urine commonly positive
  - WBC in urine not adequate for screening
  - Gram Stain cumbersome
  - NAATs
Treatment of Uncomplicated Gonorrhea
Cervix, Pharynx, Urethra, Rectum

- Ceftriaxone 250 mg IM
- PLUS
  - Azithromycin 1g po
  OR
  - Doxycycline 100mg twice a day for 7 days


Gonorrhea Treatment

- Quinolone resistance in many states
- Gonococcal cephalosporin-resistance remains an issue in U.S.
- Growing geographic distribution of in vitro decreased cephalosporins susceptibility
- Penicillin, tetracycline or quinolones are no longer gonorrhea treatment options!!!
Case 3: Vaginal Discharge for a Month

- Ashley is a 15 year old girl who complains of “smelly stuff on my underwear!” She’s had this for 3 weeks with no dysuria or abdominal pain but she’s been sexually active “a few times” with her 16 year old boyfriend. They use condoms “most of the time.” LMP was 1 week ago

Vaginal Discharge

- 3 most common causes:
  - trichomoniasis
  - bacterial vaginosis
  - candidiasis

- External vulvar inflammation without pathogens and minimal discharge:
  - mechanical, chemical, allergic or non-infectious irritation

- Diagnose by pH and microscopic examination
What Test Do You Use to Diagnose Vaginitis?

Check all that apply
- Microscopy performed by self
- Microscopy performed by lab
- CLIA-waived, rapid test
- Culture
- DNA probe (hybridization) test
- Nucleic acid amplification test (NAAT)
- No laboratory test used, i.e., clinical impression

Wet Prep
- Vaginal discharge swab mixed with normal saline
- Dab onto slide and look under light microscopy
- CLIA Waived test
- May add KOH to test for amine odor
- Can do pH testing of vaginal discharge
Trichomoniasis

- Malodorous yellow-green discharge with vulvar irritation
- T. vaginalis on wet prep, culture costly but more sensitive
- Treatment
  - Metronidazole 2g po (Best)
  - Metronidazole 500 mg bid x 7d
- Must treat sexual partners

New Vaginal Infection Treatment Option: Tinidazole

- Trichomonas: Tinidazole 2 g orally once
- Alternative BV treatment regimens
  - Tinidazole 2 g orally once daily for 2 days
  - Tinidazole 1 g orally once daily for 5 days
Other Tests for Vaginal Discharge

- APTIMA *Trichomonas vaginalis* Assay (Gen-Probe Inc, San Diego, CA)
- Can perform GC/CT/TV on 1 specimen

CLIA Waived-Point of Care Test
OSOM Trichomonas Rapid Test (Genzyme Diagnostics, Cambridge, Massachusetts)

- Immunochromatographic capillary flow dipstick technology
Case 4: “I Have Bumps Down There!”

Joanna is an 18 old who calls you frantically that she has “red bumps down there...I think it’s from shaving.” She is sexually active, never had an STI and has had 5 lifetime partners, currently with new partner of 1 month. They use condoms “sometimes” and she denies vaginal discharge but has dysuria. She’s tried antibiotic ointment but it hasn’t worked.

How Do You Determine Course of Action?

A) Swab lesions/send for HSV culture and wait for results
B) Swab lesions/send for HSV culture and begin treatment
C) Draw blood for HSV titers and begin treatment
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Genital Ulcers

- In the U.S.
  - herpes, syphilis, chancroid
- Increased risk for HIV
- Diagnostic work-up
  - Hx, PE, serology for syphilis, herpes culture
- HIV testing
  - if syphilis or chancroid
- Can treat based on most likely diagnosis
Genital Herpes Simplex

- HSV-1, HSV-2
- Viral cell culture preferred diagnostic test
  - distinguishes serotypes
- Systemic antiviral therapy for symptomatic patients
  - initial, recurrent, prophylaxis
- Topical therapy not recommended

Oral Treatment Regimens for Genital HSV Infections

<table>
<thead>
<tr>
<th></th>
<th>First Clinical Episode</th>
<th>Recurrent Outbreaks</th>
<th>Daily Suppressive Tx</th>
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</thead>
<tbody>
<tr>
<td>Acyclovir 400mg</td>
<td></td>
<td>Acyclovir 800mg</td>
<td>Acyclovir 400mg BID</td>
</tr>
<tr>
<td>TID x 7-10 days</td>
<td></td>
<td>BID x 5 days</td>
<td>BID</td>
</tr>
<tr>
<td>Famiclovir 250mg</td>
<td>Famiclovir 125mg</td>
<td>Famiclovir 250mg</td>
<td></td>
</tr>
<tr>
<td>TID x 7-10 days</td>
<td>BID x 5 days</td>
<td>BID</td>
<td></td>
</tr>
<tr>
<td>Valacyclovir 1gm</td>
<td>Valacyclovir 500mg</td>
<td></td>
<td>Valacyclovir 500-1000mg Q day</td>
</tr>
<tr>
<td>BID x 7-10 days</td>
<td>BID x 3-5 days</td>
<td></td>
<td>Q day</td>
</tr>
</tbody>
</table>
Other Ulcerative Lesions

Primary and Secondary Syphilis

- Treatment
  - Adolescents: Benzathine penicillin G 2.4 million units IM
  - Children: Benzathine penicillin G 50,000 units/kg IM up to 2.4 million units
  - Penicillin allergy: Doxycycline 100 mg bid for 2w. If pregnant, desensitize and treat with penicillin

- Serologic testing 6 and 12 months after treatment

- 4-fold increase in titer-reinfecion/treatment failure

- Test for HIV
Latent Syphilis

- Early
  - Adolescents: Benzathine Pen G 2.4 million units IM
  - Children: Benzathine Pen G 50,000U/kg IM up to adult dose
- Late
  - Adolescents: Benzathine Pen G 2.4 million units IM q week x 3 weeks
  - Children: Benzathine Pen G 50,000U/kg up to 2.4 million units q week x 3 weeks

Chancroid

- Co-factor for HIV transmission
- 10% co-infected with syphilis or herpes
- Diagnosis
  - painful genital ulcer
  - no evidence of syphilis/HSV 7d after ulcer onset
  - regional lymphadenopathy with ulcer
- Treatment
  - Azithromycin 1g po
  - Ceftriaxone 250 mg IM
  - Ciprofloxacin 500 mg bid x 3 days
Case 4: I Have Bumps Down There-Part 2

- Sue is a 17 year old who calls to say her boyfriend had a bump on his penis and now she wants to be checked. She denies dysuria or abdominal pain but says she has bleeding and dyspareunia.
- You examine her and see:

Human Papilloma Virus

- Mostly asymptomatic
- Genital Warts-commonly 6, 11 (low risk) and sometimes 16, 18, 31, 35 (high risk)
- Cervix-changes in squamous cells, abnormal Pap Smear, cervical cancer
- Anal lesions, cancer
- Respiratory Papillomatosis
- Throat cancer
What Do You Do Next?

A) Papanicoleau Smear
B) HPV testing
C) Culture Lesion
d) Treat empirically

What Do You Do Next?

A) Papanicoleau Smear
B) HPV testing
C) Culture Lesion
D) Treat empirically
Why Do You Need to Treat?

- Because they are painful or pruritic
- To avoid re-infecting her partner
- Because they are "gross!"

Treatment of Genital Warts

- Primarily for cosmetic reasons
- Also, to relieve symptoms
- Treat if immunocompromised
- Treatment may reduce, but not eliminate infectivity
- Untreated lesions will resolve spontaneously in most cases but could persist or get worse
Human Papilloma Virus
Treatment of Vaginal/Penile Lesions

- Patient applied treatment:
  - Imiquimod 5% cream qhs 3x/week for 16 weeks, wash area 6-10h after tx.
  - Podophlox 5% solution/gel bid x3d, 4 days off, repeat cycle up to 4 times
  - New in 2006-Sinecatechins 15% ointment
    - Safety and effectiveness have not been established in pediatric patients
- Provider administered treatment:
  - Trichloroacetic acid (TCA) or bichloracetic acid (BCA) 80-90%
  - Podophyllin resin 10-25%
  - Refer for cryotherapy, laser surgery, surgical removal, interlesional interferon

HPV:
Indications for Referral

- Extensive disease
- Location
  - Deep vaginal
  - Cervical
  - Urethral meatus
  - Rectal mucosa
- Persistent after medical treatment
Genital Warts-Prevention

- HPV 4 or HPV 2 vaccine for girls, HPV 4 for boys
- As young as age 9
- Generally at 11 year old visit
- 0, 2, 6 months
- Do not re-institute series if does not meet timeline, just give vaccine
- HPV 4 prevents vaginal, vulvar, cervical, anal cancer (16, 18), pre-cancer (HPV 6, 11, 16, 18) and warts (6, 11), HPV 2 prevents cancer and pre-cancer (HPV 16, 18)

Pap Smears in Adolescents

- Only for HIV positive adolescents
- Begin Pap Smears at age 21 healthy girls
- Many groups recommend for all immunocompromised girls with onset of sexual intercourse

Conclusions

- Screening for gonorrhea and chlamydia in sexually active adolescents and offering HIV testing for all adolescents is standard of care.
- Confidentiality must be assured for adolescents undergoing such evaluation and treatment, unless there are special circumstances.
- The pediatrician is at the forefront of providing their adolescent patients screening, treatment and follow up for sexually transmitted diseases.

CDC Slide Set of STD Discussed in This Presentation

- [http://www.cdc.gov/std/training/clinicalsldes/slides-dl.htm](http://www.cdc.gov/std/training/clinicalsldes/slides-dl.htm)
- A special thanks to Dr. Gale Burstein for allowing me to use some of her slides.