Sexually Transmitted Infections:
Update on Screening, Testing and Treatment Guidelines

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Disclosures

• I have no disclosures associated with this presentation

Objectives

• Describe primary and secondary levels of STI prevention
• Identify screening recommendations from CDC and USPSTF for early detection of STIs
• Distinguish various STIs and vaginitis infections
• Formulate an appropriate treatment plan of care for patients presenting with STIs

Sexually Transmitted Infections (STI) Adolescents

• 110 million in U.S.
  – 20 million new infections/year
  – $16 billion annually in direct medical costs
• 25% all teens ≥ 1 STI
• 50% in 15-25 year olds
  – Highest rates 15-19 year olds

• Risk factors
  – Unprotected sex
  – Increased susceptibility
  – Limited duration of relationships
  – Barriers to access health care

Clinical Prevention

• Methods
  – Pre-exposure vaccination
  – Risk assessment
  – Abstinence
  – Safe sex

• Counseling most effective
  – Non-judgmental, empathetic
  – Cultural sensitivity
  – Interactive strategies

Behavioral Prevention Counseling

• USPSTF recommendations
  – High Intensity Behavioral Counseling
  – All sexually active teens
  – Risk Reduction Strategies
  – Relevant messages

• Educate specific actions to reduce risk
  – Abstinence, condom use, limiting number sex partners, modify sexual practices, vaccines

Effective Prevention Counseling

- Directed at patients' personal risk
  - Situations in which risk occurs, personal goals
- Client-centered prevention counseling
  - Tailored discussion of risk reduction to patient's situation
  - Motivational interviewing
  - Risk reduction
- Project RESPECT
  - Client-centered STD/HIV prevention
  - 2 brief interactive counseling sessions
  - Tailored discussion of risk reduction lowered curable STI rates
  - Clinic-based settings


Secondary Prevention

- Reporting
  - Disease control
  - Morbidity trends
  - PA reportable diseases
    - County website
- Partner notification
  - All partners within past 60 days
  - Expedited partner treatment
    - Legal status by jurisdiction

https://www.cdc.gov/std/ept/

Screening Recommendations

- Routine STI screening for sexually active adolescents
- Annual Gonorrhea and Chlamydia screen females ≤25 years
  - Feasibility, efficacy and cost-effectiveness not as good for males
  - Chlamydia if males in high risk settings
- HIV: discuss with all adolescents and screen if sexually active 16-65 years (USPSTF and AAP)
  - Younger teens at risk and all pregnant women

VAGINITIS

Vaginal Infections

- Characterized by vaginal discharge or vulvar itching and irritation with/without vaginal odor
  - Often diagnosed in women being evaluated for STI
- Non- sexually transmitted
  - Bacterial Vaginosis (BV)
  - Vulvovaginal Candidiasis
- Sexually Transmitted
  - Trichomoniasis

Bacterial Vaginosis (BV)

- Clinical syndrome
  - Replacement of normal Lactobacilli with high concentrations of anaerobic bacteria
  - Often asymptomatic
  - May complain of dyspareunia
- Incidence: 30% of women
- Amsel’s Diagnostic Criteria
  - 3 of following criteria
    - Homogeneous, thin, white, milk-like discharge coating vagina
    - Clue cells
    - pH > 4.5; >4.7 more sensitive
    - + whiff (amine odor)
Traditional Diagnostic Testing

- Vaginal swab
  - Provider/self collected
  - With/without speculum
- KOH: dilution of vaginal smear on slide with 10% potassium hydroxide produces amine odor in BV; microscopic exam of slide can yield pseudo hyphae of Candida
- WET PREP: microscopic exam of vaginal smear diluted with 9% NSS yields clue cells which are identified as bacteria-laden cells with poor border delineation in BV
- pH: elevated with BV or Trichomoniasis (>4.5)

Microscopic Exam

- Clue cells
- Normal cells
- Vaginal smear on slide without KOH

Diagnosis: Rapid or Culture?

- OSOM BVBlue
  - "More sensitive than whiff"
- Affirm VP III: BV/Trich
- Vaginal swab/DNP probe
- 92% sensitivity/98% specificity compared to wet prep, 92%/99% c/p cx
- PIP Activity Test Card (BV)
  - Not recommended
- VS-Sense: low sensitivity
  - Detects pH > 4.7 +0.3/-0.2
  - Not recommended

- Gram Stain
- Clinical criteria correlates with gram stain (CDC)
- Aptima culturette
  - Not specific for BV
- Pap smear
  - High diagnostic error

BV Treatment

- Treat: symptomatic and/or at risk for STD/pregnancy due to increased risk PID/preterm labor
  - Oral: Metronidazole 500mg bid x 7 day
  - Topical: Metronidazole gel .75% intravaginally OD x 5d
  - Clindamycin cream 2% intravaginally QID x 7d

- Consider side effects
  - ETOH, GI
- Adverse effects
  - Pregnancy category C but harm of pre-term labor is greater
- Recurrent
  - Metronidazole gel twice/week x 4-6 months

Alternative Treatments BV

- Tinidazole orally
  - 2 g po x 2 days or 1 g x 5 days
- Clindamycin
  - 300mg po BID x 7 d
  - 100mg ovelles intra-vaginally for 3 nights
  - May weaken latex products
  - No condoms x 72 hours after treatment
- Intra-vaginal lactobacillus preparations
  - Efficacy trials to restore normal flora
**Vulvovaginal Candida (VVC)**

- 75% of women at least one episode
- Typical: pruritis, vaginal discharge, vulvar burning, dysuria, erythema
- Uncomplicated: short course topical formulation, OTC antifungal
- Complicated (office-based testing: culture to confirm)
  - Recurrent if 4 or more per year
  - Longer duration 7-14 days topical or
  - Oral dose fluconazole 100mg/150 mg/200mg every 3rd day for 3 doses
- Maintenance regimen
  - Oral dose fluconazole 100mg/150 mg/200mg weekly for 4 weeks

**Trichomoniasis**

- Sexually transmitted vaginitis
- Not reportable
- Follow up not recommended
- Males may not have symptoms
- Presentation
  - Yellow-green, diffuse malodorous vaginal discharge
  - Vulvar irritation

**Diagnostic Testing: Trichomoniasis**

- Diagnosis
  - NAAF testing
    - Endocervical, vaginal, urine
    - Highly sensitive; 3-5 times more than wet prep
    - 74-88% sensitivity, 87-98% specificity
  - Microscopic Wet Prep/Smear
    - 50-60% sensitivity
  - PAP poor indicator
- OSOM Trich Rapid
  - Sensitivity > 83%, specificity > 97%
  - 10 min
  - Affirm VP III
    - Sensitivity > 83%, specificity > 97%
  - 45 minutes
- 60-70% sensitivity
Treatment Trichomoniasis

- **Treatment**
  - **Recommended**
    - Metronidazole 2g single dose (GI distress)
    - Tinidazole 2g po single dose
  - **Alternative**
    - Metronidazole 500mg BID x 7 days
- If pregnant, increased risk for prematurity and low birth weight

Vaginal Discharge Differential Diagnosis

<table>
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<th>pH</th>
<th>Amoeba</th>
<th>Trichomonas</th>
<th>BV</th>
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<td>None</td>
<td>None</td>
</tr>
<tr>
<td>6</td>
<td>Vaginal discharge</td>
<td>Vaginal discharge</td>
<td>Vaginal discharge</td>
</tr>
<tr>
<td>7</td>
<td>Vaginal discharge</td>
<td>Vaginal discharge</td>
<td>Vaginal discharge</td>
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- **Symptoms**: Itchy, burning, erythema
- **Microscopy**: Pseudo hyphae, Motile organisms with flagella, Clue cells

Diseases Characterized by Urethritis

- **Confirmed urethritis**
  - Muco-purulent or purulent discharge
  - Gram stain
  - Positive leukocytes on first void urine
- **Causes**
  - Epididymitis
  - N. Gonorrhea (GC)
  - Nongonococcal Urethritis (NGU)
  - C. trachomatis

Sexually Transmitted Infections

Urethritis

**NGU**
- **Recommended**
  - Azithromycin
    - Single dose 1 g
  - Doxycycline
    - 100 mg BID x 7 days
- **Alternative**
  - Erythromycin 500mg QID x 7d
  - Levofloxacin 500mg daily x 7 days
  - Ofloxacin 300mg BID x 7 days
- **GC**
  - Increased efficacy with concurrent treatment for chlamydia
  - Administer same day, simultaneously and observed
  - Ceftriaxone single dose
    - 250 mg IM single dose
  - Doxycycline
    - Azithromycin 1 g po single dose
  - If Ceftriaxone not available
    - Cefixime/Suprax
      - 400mg single dose

Mycoplasma Genitalium

- Implicated in NG urethritis in men
- 15-20% cases; up to 30% persistent or recurrent cases
- Diagnosis: NAAT tests in large hospitals in metropolitan areas but not FDA approved in U.S.
- **Treatment**
  - Poor response to doxycycline
  - Emerging resistance to azithromycin
  - Treatment of choice if suspect
    - Moxifloxacin 400mg/day for 14 days
Gonorrhea and NGU Urethritis

- Both reportable to local health department
- Partners within the past 60 days should be notified of exposure
- Expedited treatment for partners

Diseases Characterized by Mucopurulent Cervicitis (MPC)

- Etiology
  - N. Gonorrhea (GC)
  - C. Trachamatis (CT)
  - Often co-infected
- Partner notification: required for identified or suspected contacts within past 60 days: asymptomatic chlamydia

C. Trachomatis (Chlamydia)

- Symptoms
  - Often asymptomatic
  - AAP: annual routine urine screening sexually active adolescents
- Treatment options
  - Azithromycin/doxycycline or alternative
- Sequelae: PID, ectopic pregnancy and infertility
- Follow up: test of cure not recommended
  - Repeat testing for re-infection 3-6 months
  - Partner notification past 60 days
- Reportable disease

N. Gonorrhea

- Symptoms
  - Women often asymptomatic until complications occur
- Sequelae
  - PID, ectopic pregnancy and infertility
- Follow up
  - Test of cure 14 days if alternative regime used for oropharyngeal GC
  - Repeat testing for re-infection 3-6 months
  - Partner notification past 60 days
- Reportable Disease

Diagnostic Testing Gonorrhea, Chlamydia

- Culture
  - Endocervical/Urethral
    - Most accurate
- Nucleic Acid Amplification Tests (NAAT)
  - Vaginal DNA probe
  - Sensitivity 90% and Specificity 97-99%
- Annual urine based NAAT if sexually active or risk factors
  - Multiple partners past 6 months
- Urine based
  - > 2 hrs since last void
  - Sensitivity, specificity slightly lower

Point of Care Screening

- Annual urine based screening on all sexually active teens
- Endocervical/urethral NAAT specimen if pelvic/intraurethral swabs are "acceptable"
- Sensitivity and Specificity of vaginal NAAT testing adequate
  - Provider collected or self-collected
    - Both equally effective
- Rectal or Pharyngeal specimens
  - Culture still recommendation
Treatment Review for GC

- First line
  - Ceftriaxone 250 mg IM
  - Plus
  - Azithromycin 1 g po
- Administer same day, simultaneously and observed
- If Ceftriaxone unavailable
  - Cefixime 400 mg po single dose
  - Enhanced efficacy when dual treatment with azithromycin
  - Limited efficacy with pharyngeal GC
- Alternative injectable cephalosporins
  - Azithromycin 2 g po: concerns about resistance
- Test of Cure
  - If cefixime used for oropharyngeal GC

Resistance

- Recent strain GC resistant to cephalosporins (7/2016-Hawaii)
  - Maintain high diligence following appropriate treatment guidelines
  - Clients who remain symptomatic after recommended treatment
  - Retest by both NAA T and GC culture 3 weeks after initial treatment
  - GC culture with susceptibility testing to evaluate GC treatment failure

Treatment Considerations

- Empiric therapy
  - Presumptive diagnosis
  - Dual therapy
  - Co-infection/improve d efficacy
  - Oral sex exposure
- Allergies
- Adverse reaction
- Resistance

Complications

- GC
  - Gonococcal conjunctivitis
  - Disseminated Gonococcal Infection (DGI)
  - GC Meningitis and Endocarditis
  - Ophthalmia neonatorum
  - Pelvic Inflammatory Disease

Pelvic Inflammatory Disease

- Spectrum of inflammatory symptoms of upper female genital tract
- Risk factors: multiple sex partners, early coital debut, ectopy
- Symptoms: lower abdominal pain, fever, vaginal discharge, dyspareunia, abnormal bleeding, especially post-coital bleeding
- Clinical diagnosis 65-90% sensitivity
- Sequaelae: infertility

PID Incidence

- Decreased rates since increase in detection and treatment STIs
- Decreased rates of ectopic pregnancy and infertility
PID

- Diagnostic evaluation (Low threshold for clinical dx)
  - Abdominal pain and ≥1 of following
    - Bimanual exam: uterine/adnexal tenderness or cervical motion tenderness (CMT)
  - ≥1 following criteria enhances diagnosis
    - T > 101, abnormal cervical mucopurulent discharge
    - Increased WBC on wet prep, increased ESR/CRP
  - Most specific criteria: lap, biopsy, transvaginal USN
  - Out-patient management
    - Compliant with meds and return to office 72 hours for recheck (mandatory)
  - Criteria for hospitalization
    - Surgical emergencies, pregnancy, non-compliance, severe illness, tubo-ovarian abscess, no response to oral therapy at 72 hours

PID Treatment

- Parental
  - Continue for 48 hours after substantial clinical improvement
  - Cefoxitin or clindamycin plus doxy preferably oral route
- Out-patient
  - Initiate within 24 hrs
  - Ceftriaxone 250mg IM PLUS
  - Doxycycline 100mg BID x 14 days
  - With or without Metronidazole
  - Must have compliance with treatment for 2 weeks AND return for bimanual in 72 hours

PID Treatment

- Follow up: substantial clinical improvement within 3 days of treatment
  - Bimanual exam in 3 days if oral treatment outpatient is MANDATORY
  - Management of sex partners: exam/treatment if contact within past 60 days
  - Prevention: screening and treating high risk women

Mycoplasma Genitalium

- Less defined role in women
- Cervicitis/PID
  - More common
  - Treatment implications
    - If PID is non-responsive to traditional treatment in 7-10 days consider use of Moxifloxacin 400mg/day for 14 days

Genital lesions

- Human Papillomavirus Infection (HPV)
  - Many types: 40 types are carcinogenic
  - HPV types 16 & 18 most responsible for 70% cervical cancer: new recommendations for 9 valent=85% coverage
  - HPV types 6 & 11 usually visible warts
  - Other anogenital types can be associated with cervical neoplasia; recent indication for anal and oropharyngeal cancer
  - 77% oropharyngeal cancer due to HPV infection
- Genital ulcers
  - Genital herpes virus (HSV): type 1 or 2
  - Chancroid-reportable
  - Granuloma inguinale-reportable

Human Papillomavirus Virus (HPV) and Teens

- Prevalence 110 million
- 20 million new cases each year
- 49% of all STI’s
- Highest incidence in 15-24 year age group

Risk factors

- Multiple sex partners
- Early age sexual debut
- Cigarette smoking
- Cervical ectopy
Clinical Manifestations of HPV

- Anogenital warts
  - Condyloma acuminata
    - Cauliflower-shaped growths
  - Papular
  - Keratotic
  - Flat-topped
  - Diagnostic: visual inspection
  - Non-responsive
  - Referral for biopsy

- Subclinical HPV infection
  - Abnormal cervical cytology

- Diagnosis: visual inspection
  - Non-responsive
  - Referral for biopsy

External HPV Treatment Options

- Patient applied
  - Podophyllin solution/gel 0.5%
  - Imiquimod cream 3.75% or 5%
  - Sinecatechins 15% ointment

- Provider administered
  - Cryotherapy
  - Surgical removal
  - Trichloroacetic acid (TCA) or Bichloroacetic acid (BCA) 80%-90%

External HPV Alternative Regimens

- Intra-lesional interferon
- Photodynamic therapy
- Topical cidofavir

- Podophyllin resin no longer recommended except provider-administered treatment under conditions of strict adherence due to reports of severe systemic toxicity

Subclinical Genital HPV Infection

- Absence of exophytic warts
- Abnormal PAP smear
- Dysplasia
  - Atypical Squamous Cell of Undetermined Significance (ASCUS)
- Definitive diagnosis
  - HPV DNA in cervical cells

Cervical Cancer Screening PAP Smear

- Frequency
  - Initial: age 21
  - 21-29 every 3 years
  - 30-65 co-testing with cytology and HPV testing every 5 years preferred
  - Cytology alone every 3 years
  - More frequent if risk factors
  - HPV, Immunosuppression, treated for CM or cervical cancer

- Incidental Findings
  - Inflammatory changes
  - Evidence of fungus
    - Impacted by
    - Menstruation
    - Obtaining endocervical cells

http://www.asccp.org/Guidelines

Results of PAP Smear

- Results
  - Negative for Intra-epithelial lesions
  - Atypical Squamous Cells of Undetermined Significance: ASCUS
  - Low Grade Squamous Intraepithelial Lesion: LSIL
  - High Grade Squamous Intraepithelial Lesion: HSIL
Abnormal Results Follow-up

- HPV Hybrid capture of HPV DNA in liquid-based cytology (thin prep)
  - Immune system clears 90% resolution of HPV under age 21
  - Increase in premature births if treated with excisional procedures for dysplasia
- ASCCP consensus guidelines for abnormal pap smears:
  http://www.asccp.org/Guidelines

Genital Ulcers

Genital Herpes Simplex Virus (HSV)

- Diagnosis
  - Virologic tests: culture open lesion
  - Serologic tests: type specific
- First Episode
  - 30% HSV 1

HSV Management

- First episode often 7-10 days; recommend treating
  - Acyclovir 400mg TID
  - Famciclovir 250mg TID
  - Valacyclovir 1g BID
  - Famcyclovir 250mg TID
- Recurrent episodes: any above
  - Episodic therapy: self-initiate within 1 day of lesion onset or during prodromal period
  - Suppressive therapy: Valacyclovir recommended
    - Frequent recurrences (>6/year)
    - Reduces by 70-80%
    - Quality of life
    - Does not eliminate subclinical shedding
- Notification of partners

Reportable Genital Ulcers

- Chancroid
  - Discrete outbreaks in US
  - Cofactor for HIV
- Granuloma Inquinale
  - Tropical and developing areas

Recommendations

Special Populations

- Persons infected with HIV
  - Annual screening Hepatitis C
  - HIV infected women: annual screening Trichomoniasis
- Pregnant women
  - Syphilis, HIV, chlamydia, Hepatitis B screening
  - Gonorrhea screening for at-risk pregnant women first prenatal visit
- Men who have sex with men (MSM)
  - Annual screening syphilis, chlamydia, gonorrhea and HIV
  - MSM with multiple/anonymous partners
  - Screen for STIs every 3-6 months

Vaccine Preventable STIs

- HPV
  - Most common STI
  - Nearly 100% effectively prevents multiple HPV-related cancers
  - Recent decline in HPV-related infections
- NEW RECOMMENDATION
  - 2 dose series 6-12 months apart for 11-14 yr olds
- Hepatitis A
  - Most commonly transmitted by fecal-oral route but can be transmitted during sexual activity
- Hepatitis B
  - Check up to date on 3 dose series
2015 Updates Summary

- Alternative treatment to GC
- NAAT testing for trichomoniasis
- Alternative treatment options genital warts
- Mycoplasma genitalium
- Updated HPV vaccine recommendations and counseling
- Annual Hepatitis C test if HIV +
- Retesting to detect repeat infection
- Management of transgender

CDC Resources

- Prevention counseling, risk assessment
  - http://www.cdc.gov/std/tg2015/clinical.html#boy
  - http://nptc.org/clinical-ppts/
- STI treatment resources for clinicians
  - http://www.cdc.gov/std/treatment/resources.htm
- HIV prevention
  - https://effectiveinterventions.cdc.gov
- HPV vaccine
  - https://community.napnap.org/pathreerivers/how

CDC mobile application


Case 1

- HPI: 15 year old female presents with vaginal discharge noted after sexual intercourse; endorses vulvar irritation and odor but denies pruritis, abdominal pain or dyspareunia
- SH: sexually active with partner of 5 years; admits to coitus with a new partner once 1 month ago without condom use
- Physical exam: mild LLQ pain; external genitalia without visible discharge or erythema

Case 1 Question

- What diagnosis (es) should you consider?
  A. Pelvic Inflammatory Disease (PID)
  B. Bacterial Vaginosis (BV)
  C. Trichomoniasis
  D. B & C
  E. All of the above

Case 1 Question

- According to CDC guidelines, what diagnostic testing would you perform?
  A. Endocervical DNA probe and bimanual exam
  B. Vaginal NAAT testing and bimanual exam
  C. Wet prep, KOH whiff test and pH
  D. A only
  E. A & C
  F. A or B and C
Case 1 Question

• If the bimanual exam is negative for cervical motion tenderness (CMT) and KOH whiff is positive with wet prep revealing clue cells, which of the following is the CDC recommended treatment regimen?
  A. Metronidazole 500mg BID for 7 days
  B. Ceftriaxone 250mg IM and Azithromycin 1gram

Let’s check the CDC STI app for the answers

Case 2

• HPI: A 16 year old male presents with systemic symptoms: fever, sore throat and malaise
• Physical exam reveals fever of 101, ill-appearing young man; pharynx without redness or exudate and neck negative for lymphadenopathy.
• As you leave the room to get a throat culturette, he tells you he has bumps on his penis
• Physical exam reveals vesicular lesions on shaft of penis

Case 2 Question

• You suspect HSV and he wants to know what type it is - what diagnostic testing would you order in ?
  A. HSV viral culture of an open lesion
  B. HSV serologic testing
  C. Either A or B

Let’s check the CDC STI app for the answer

Case 3

• A 21 year old female presents for a well visit; her social history includes that she has been sexually active but not in the past 2 months; she endorses condom use 75% of the time and had chlamydia with her last partner; LMP was 2 weeks ago

Case 3 Question

• What type of screening would you do if any?
  A. Urine-based NAAT testing for Chlamydia
  B. Vaginal NAAT testing for Gonorrhea and Chlamydia
  C. PAP smear screening and endocervical NAAT testing for Gonorrhea and Chlamydia
Case 4

- An 18 year old female presents with concern for STI exposure; she was informed by her partner who tested positive about 6 weeks ago; she endorses abdominal pain; LMP 1 month ago
- Physical exam reveals right lower quadrant (RLQ) tenderness; external genitalia without discharge
- You perform a bimanual exam and collect a vaginal NAAT swab for STI testing.

Case 4 Question

- Her bimanual exam is positive for cervical motion tenderness (CMT). What is the CDC recommended treatment for her?
  A. Treat upon receipt of STI testing results
  B. Ceftriaxone 250mg and Doxycycline 100mg BID for 2 weeks with or without Flagyl 500mg BID for 7 days; must return for bimanual exam in 72 hours
  C. Ceftriaxone 250mg and Azithromycin 1g with Flagyl 500mg BID for 7 days

References

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