SEXUALLY TRANSMITTED DISEASES IN CHILDREN AND ADOLESCENTS

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Departement Pediatrics And Adolescent
Geneva University Hospitals
WHAT IS A STI?

20 different infectious agents acquired and/or spread by various types of sexual contact:

- Vaginal/anal intercourse
- Hand-genital contact
- Oral-genital contact
- Oral-anal contact

1995 WHO estimates - 340 million new cases/y of syphilis, gonorrhea, chalmydia and trichomoniasis

US - 19 million new cases/y, half among 15-24y
Direct medical costs -$13 billion annually.
# INFECTIOUS AGENTS THAT CAN BE SPREAD THROUGH SEXUAL CONTACT

<table>
<thead>
<tr>
<th>Viral diseases</th>
<th>Hepatitis A virus (HAV)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hepatitis B virus (HBV)</td>
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<tr>
<td></td>
<td>Hepatitis C virus (HCV)</td>
</tr>
<tr>
<td>Herpes viruses</td>
<td>Herpes simplex virus types 1 &amp; 2 (HSV-1, HSV-2)</td>
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<tr>
<td></td>
<td>Cytomegalovirus (CMV)</td>
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<tr>
<td></td>
<td>Epstein-Barr virus (EBV)</td>
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<tr>
<td>Human lymphotropic virus (HTLV-1)</td>
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<tr>
<td>Human immunodeficiency virus (HIV-1, HIV-2)</td>
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<tr>
<td>Human papillomavirus (HPV)</td>
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<tr>
<td>Molluscum contagiosum</td>
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</table>

<table>
<thead>
<tr>
<th>Bacterial diseases</th>
<th>Bacterial vaginosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Klebsiella granulomatis (granuloma inguinale, donovanosis)</td>
</tr>
<tr>
<td></td>
<td>Chlamydia trachomatis</td>
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<tr>
<td></td>
<td>Serovars A–K (urethritis, cervicitis, PID)</td>
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<tr>
<td></td>
<td>Serovars L1, L2 or L3 (lymphogranuloma venereum (LGV))</td>
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<tr>
<td></td>
<td>Haemophilus ducreyi (chancroid)</td>
</tr>
<tr>
<td></td>
<td>Neisseria gonorrhoeae (GC)</td>
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<tr>
<td></td>
<td>Treponema pallidum (syphilis)</td>
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<table>
<thead>
<tr>
<th>Fungal infections</th>
<th>Candida species (vulvovaginal candidiasis)</th>
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<tbody>
<tr>
<td></td>
<td>Histoplasma capsulatum (histoplasmosis)</td>
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<thead>
<tr>
<th>Parasitic diseases</th>
<th>Entamoeba histolytica</th>
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<tr>
<td></td>
<td>Trichomonas vaginalis (trichomoniasis)</td>
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<tr>
<td></td>
<td>Phthirius pubis (pediculosis pubis, pubic lice)</td>
</tr>
<tr>
<td></td>
<td>Sarcoptes scabiei (scabies)</td>
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</tbody>
</table>

From Pediatric, Adolescent and Young Adult Gynecology, Wiley-Blackwell, 2009, Ch.40, STI, Sperling R
### Infectious Agents That Can Be Spread Through Sexual Contact

**Viral diseases**
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- Hepatitis B virus (HBV)
- Hepatitis C virus (HCV)
- Herpes viruses
  - Herpes simplex virus types 1 & 2 (HSV-1, HSV-2)
- Cytomegalovirus (CMV)
- Epstein-Barr virus (EBV)
- Human T-lymphotropic virus (HTLV-1)
- Human Immunodeficiency virus (HIV-1, HIV-2)
- Human papillomavirus (HPV)
- Molluscum contagiosum

**Bacterial diseases**
- Bacterial vaginosis
- *Klebsiella granulomatis* (granuloma inguinale, donovanosis)
- *Chlamydia trachomatis*
  - Serovars A–K (urethritis, cervicitis, PID)
  - Serovars L1, L2 or L3 (lymphogranuloma venereum (LGV))
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- *Neisseria gonorrhoeae* (GC)
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**Fungal infections**
- Candida species (vulvovaginal candidiasis)
- *Histoplasma capsulatum* (histoplasmosis)

**Parasitic diseases**
- *Entamoeba histolytica*
- *Trichomonas vaginalis* (trichomoniasis)
- *Phytophthera psidii* (pediculosis pubis, pubic lice)
- *Sarcoptes scabiei* (scabies)

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From Pediatric, Adolescent and Young Adult Gynecology, Wiley-Blackwell, 2009, Ch.40, STI, Sperling R
2011 Youth Risk Behavior Survey

• While a significant delay in testing for STIs has been found for younger adolescents, one study of urban female teens found that the median interval between first intercourse and first STI was 2 years.
  

• By age 15 years, 25% of women had acquired their first STI.

• The high prevalence of STIs soon after sexual initiation was supported in a CDC-sponsored study, which noted a 26% prevalence of 5 STIs evaluated among adolescent females within 1 year of sexual initiation.

## QUELQUES INFORMATIONS GENEVOISES 2012-2013
Service de dermatologie HUG et DARES

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<th>Données IST du 01.01.2013 au 19.09.2013 - Canton de Genève</th>
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<td>partenaire contacté</td>
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<td>partenaire traité</td>
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Sur la base de formulaires de déclaration des maladies transmissibles à déclaration obligatoire : OFSP
Gonorrhée, Hépatite B, VIH/SIDA, Syphilis : déclaration obligatoire par le médecin; Chlamydiae : déclaration de laboratoire
Youth at Risk

- **Adolescents:**
  - ↓ use condoms, ↑ multiple partners, ↓ have sex in the context of an intimate relationship.
  - ↑ concrete thinkers, ↓ good judgment and decision making > inability to plan ahead


- **Those at High risk for STIs:**
  - Early coitarche, sexual activity with a new partner, multiple sexual partners, and substance use > ↓ safe sex behaviors
  - A significantly older partner predisposes an adolescent to a relationship power imbalance, thus making sexual negotiation more difficult, ↑ risk of involuntary intercourse and unsafe sex practices, ↑ potential exposure to STIs.

*Division of STD Prevention: Sexually Transmitted Disease Surveillance 2009. Atlanta, U.S., Department of Health and Human Services, Centers for Disease Control and Prevention, 2010*


Youth at Risk

• Adolescent females are more biologically susceptible to becoming infected when exposed to STIs, due to cervical ectopy, decreased local immunity, a smaller introitus, and a lack of lubrication that can lead to traumatic sex; Female victims of childhood sexual abuse are at an increased risk for STIs, possibly due to younger age at sexual initiation and unsafe sex practices.


• At-risk youth often lack confidential and affordable health care and suffer from fear of disclosure or lack of education.

• Compared to their heterosexual peers, self-identified gay, lesbian, and bisexual youth are more likely to report having had sexual intercourse, ↑partners, sexual contact < 13 years > increased risk STIs.
WHY WORRY ABOUT STI ??

- Untreated STI have **acute** morbidity, as well as, **long term** health, **somatic and psychological consequences**.

- Many STI pathogens may **facilitate** the acquisition and **transmission** of HIV.
HEALTH CONSEQUENCES OF COMMON STI

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Health consequences</th>
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</table>
| Chlamydia | If untreated, 30–40% of women will develop pelvic inflammatory disease (PID)  
If PID develops, ~20% risk of infertility and ~20% with chronic pelvic pain  
If untreated and exposed to HIV, 5 times more likely to become HIV infected  
If pregnant, increased risk of ectopic pregnancy  
If untreated and pregnant, high risk for delayed postpartum endometritis  
If untreated and pregnant, newborn at risk for conjunctivitis and pneumonia |
| Gonorrhea (GC) | If untreated, majority of women will develop PID  
If PID develops, ~20% risk of infertility and ~20% with chronic pelvic pain  
If untreated and exposed to HIV, 3–5 times more likely to become infected  
If pregnant, increased risk of ectopic pregnancy  
If untreated and pregnant, increased risk for disseminated GC (an acute dermatitis/tenosynovitis syndrome, which can be complicated by arthritis, meningitis or endocarditis)  
If untreated and pregnant, risk of premature delivery  
If pregnant and untreated, newborn at risk for severe sight-threatening conjunctivitis and rarely, sepsis with associated meningitis, endocarditis or arthritis |
| Syphilis | If early syphilis is untreated, risk of latent syphilis  
If untreated and pregnant, risk of intrauterine fetal demise  
If untreated and pregnant, risk of premature delivery  
If untreated and pregnant, newborn at risk for congenital syphilis |

From Pediatric, Adolescent and Young Adult Gynecology, Wiley-Blackwell, 2009, Ch.40, STI, Sperling R
CASE 1

A 16 y-o adolescent consults for contraception. She has a new boy friend, coitarche a month ago after 2 months of going out together. Condoms use 7/10. Asymptomatic.

To screen or not to screen?
• Annual screening of all sexually active women < 25y recommended, with more frequent screening for those at increased sexual risk.

• Screening of men is recommended in clinical settings with a high prevalence of chlamydia (eg, adolescent clinics, correctional facilities, STD clinics) and as a 2° strategy to prevent chlamydia infection among women.

A 26% prevalence rate in male partners to treated women > re-infections ↑

GONORRHEA (GC)

• Screening of all sexually active women at increased risk for infection is recommended, risk defined as women <25y or those with:

• a prior history of gonorrhea infection or other STIs, new or multiple sex partners, inconsistent condom use, sex work, drug use, or residence in urban communities or communities with high rates of poverty.

• No recommended routine screening for men
**TRICHOMEONAS VAGINALIS (TV)**

- Women should be screened if they are at risk for infection due to new or multiple partners, have a history of STIs, exchange sex for payment, or use injection drugs.

**BACTERIAL VAGINOSIS (BV)**

- No routine screen
**SYPHILIS**

- Should be **screened** for syphilis **annually**, populations at increased risk for syphilis infection MSM who engage in anal sex, **sex workers**, persons who exchange sex for drugs, and those in adult **correctional facilities**. All **pregnant women**.

**HERPES SIMPLEX VIRUS (HSV)**

- No routine serologic screening for HSV, including in asymptomatic pregnant women.
HUMAN PAPILLOMAVIRUS (HPV)

• The most recent recommendation ACOG is that routine testing is not indicated for cervical cytology in women <21y and for cervical HPV in women <30y.

• Due to lack of evidence on the reliability of screening methods as well as the safety of and response to Tx, routine testing for anal cytology or anal HPV is not recommended at this time.
HIV

• The CDC Sexually Transmitted Diseases Treatment Guidelines-2010 recommend that all individuals between 13-64 y be screened in all health care settings at least once for HIV, regardless of recognized risk factors.

• Annual screening for HIV should be provided to sexually active MSM.

• All sexually active HIV-infected individuals should be screened for gonorrhea, chlamydia, and syphilis.

• CDC estimates 21% of HIV infected individuals are unaware of their disease and that approximately 50% of new HIV infections are transmitted by individuals unaware of their disease. It is estimated that knowledge of HIV status could reduce new infections by 30% due to behavior change.
DISEASES CHARACTERIZED BY VAGINAL DISCHARGE
CASE 1

• A 4.5 y-o brought by her mother because of persistent vaginal discharge with redenning of the vulvar area.
• Parents also noticed “smelly bottoms”.
• Girl started school 3 months ago.
VULVO-VAGINITIS IN PRE-PUBERTAL GIRLS

• Most frequent complaint in paediatric gynaecology.

• Patient history and physical examination usually suffice for the diagnosis—vulvite non spécifique. **No swabs are necessary**, unless: susp of sexual abuse, discharge persists after hygienique measures, bleeding.

• Etiologies: **Germes d’origine respiratoire ou entérale**: (streptococcus B hémolytique groupe A, S. aureus, H. Influenza, S. pneumoniae, E. Coli, proteus vulgaris, Shigelle); **Oxyures; Corps étrangers; Tumeur d’origine gynécologique**: polype, sarcomes botryoïde; **Pathologie urinaire**: uretère ectopique, prolapus urétral; **Maladie systémique** avec manifestation vulvo-vaginale (varicelle, rougeole, EBV, Crohn, Kawasaki, syndrome de Behçet…); **Maladie cutanée** avec manifestation vulvaire (dermatite atopique, lichen scléreux, psoriasis, Herpès simplex; **C. trachomatis, N.gonhorreae, T. vaginalis** (STIs).
TREATMENT OF NON SPECIFIC VUVLVITIS

• Make sure direction of wiping is correct (front to back)
• Good and regular hygiene measures; twice a day « sitz-bath » water only.
• Avoid « wet-ones », bubble bath; soaps; Wash clothes
• Only white cotton underwear.
• Antibiotic treatment if growth of a predominant germ on cultures.
CASES 2 & 3

• 15.5 y-o vaginal irritation of few months. Occasionally “smells bad”. Sexual relationship with same boy friend for over a year. Condoms +.

• 16 y-o comes to talk about her discomfort while having sex. She has noticed her underwear often wet and need to use a protection slip. Boyfriend says his penis “burns” after he urinates.
VULVO-VAGINITIS

- Vaginal discharge
- Vulvar itching/irritation
- Vaginal odor +/-

- Caused by Bacterial Vaginosis, Trichomaniosis and Candidiasis.

- Type determined by PH and microscopic exam of fresh samples discharge.
BACTERIAL VAGINOSIS (BV)

• Most prevalent cause of vaginal discharge.

• Disorder of the microbial environment overgrowth of pathogenic anaerobic bacteria (Gardnerella vaginalis, Mobiluncus, Bacteroides, Prevotella, & mycoplasma). Lactobacilli, usually 95% of the vaginal bacterial population, provide immune protection due to an acidic pH and the production of hydrogen peroxide. Reduction of lactobacilli destroys this immune protection.

• BV incidence has been reported to be from 4% - 61% in populations ranging from private practices to STI clinics, More in black > white, cigarette smoking, sexual activity, and vaginal douching.


• The malodorous, homogeneous discharge of BV often intermittent.

  Increased risk for acquisition of HIV, gonorrhea, chlamydia, and HSV type 2, as well as, PID and complications following gynaecological surgery (vaginal cuff cellulitis), endometritis (post Ab; IUD), preterm delivery, chorioamnionitis and post partum endometritis.
TRICHOMONAS VAGINALIS (TV)

• TV is asymptomatic in 50% of females and almost in all males, with an incubation period of 3-28 days.

• Symptomatic females may present with a foul-smelling, frothy yellow-greenish discharge, along with pruritus, dysuria, dyspareunia, post-coital bleeding, or prolonged menses.

• Symptomatic males may present with dysuria and a clear discharge (= non-gonococcal urethritis).

• TV responsible for preterm labor as well as for an increase in transmission and shedding of HIV.

• Wet mount evaluation recommended, but also cultures.
Vaginal Discharge

1) Ask about douching (predisposes to BV, some STDs, and HIV)
2) Assess amount, color, consistency of vaginal discharge
3) Look for mucopurulent endocervical discharge

Mucopurulent endocervical discharge, See Cervicitis algorithm

1) Perform NAAT for gonorrhea and chlamydia
2) Perform vaginal pH testing
3) Perform pregnancy testing
4) Offer HIV testing

pH ≤ 4.5
Ammonia test negative (no fishy odor when KOH applied to vaginal fluid)
Discharge appears normal or none is present

Discharge scented, dampened, and/or vaginal epithelial cells/periurethral exudates present

If microscopy available,
Saline prep with normal epithelial cells, lactobacilli predominate
WBCs usually present

Yeast buds or pseudohyphae seen on EITHER saline OR KOH prep?

NO

Still could be yeast vaginitis; OR normal vagina, search for other cause (e.g. chemical vulvovaginitis - douches, irritative vulvovaginitis (foreign body), or atrophic vaginitis)

Yeast vaginitis
Is it uncomplicated or complicated (recurrent, severe, pregnant, non-C. albicans, immunocompromised)?

Bacterial vaginosis diagnosed if at least 3 of following 4 criteria satisfied:
1) Homogeneous discharge
2) pH > 4.5
3) Ammonia test positive
4) Clue cells >20% of epithelial cells

Metronidazole 500mg PO BID x 7 days* OR
Clindamycin cream 2% 5g QHS x 7 days intravaginally OR
Clindamycin cream 2% 5g QHS x 7 days intravaginally
(other regimens available**)

Metronidazole 500mg PO BID x 7 days

Complicated

Any intravaginal imidazole 7 days OR
Fluconazole 150 mg PO x 1 dose

Recurrent (>4/year):
Any intravaginal imidazole 7-14 days OR
Fluconazole 150 mg PO Q72hours x 3 doses

Severe (i.e. extensive vulvar erythema, edema, erosion, fissure formation):
Any intravaginal imidazole QHS x 7-14 days OR
Fluconazole 150 mg PO Q72hours x 2 doses

Pregnant:
Any intravaginal imidazole QHS x 7 days

Immunocompromised:
Any intravaginal imidazole QHS x 7-14 days
If no response to treatment, consider C. glabrata; treat 7-14 days of a nonfluconazole azole drug
(see 2010 CDC STD Treatment guidelines)

Not necessary to treat partner

Trichomoniasis

If microscopy available, motile trichomonads present?

NO

Still could be trichomoniasis. Consider sending additional testing for 7. vaginitis if available.

YES

Metronidazole 2g PO x 1 dose OR
Tinidazole 2g PO x 1 dose; HIV-infected consider
Metronidazole 500mg PO BID x 7 days

Partner management**

*Oral therapy preferred for pregnant women with BV, because of possibility of subclinical upper genital tract disease.

**See 2010 CDC STD Treatment Guidelines for further details.

Although this algorithm implies patients have mutually exclusive diagnoses, some patients have more than one diagnosis.
<table>
<thead>
<tr>
<th>Symptômes</th>
<th>Vaginose bactérienne</th>
<th>Vaginite aérobie</th>
<th>Infection mixte</th>
<th>Candidose vulvovaginale</th>
<th>Trichomoniasis vulvovaginale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecoulement gris-blancâtre très fluide, homogène, odeur de poisson</td>
<td>Ecoulement vert-jaunâtre persistant</td>
<td>Ecoulement jaune-blancâtre très fluide, parfois brûlures, prurit</td>
<td>Prurit, brûlures, écoulement jaune-blancâtre grumeleux, dyspareunie</td>
<td>Ecoulement jaune-vert homogène, très fluide, mousseux, dysurie, prurit, brûlures</td>
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<tr>
<td>Observations</td>
<td>Aucune rougeur, aucune inflammation</td>
<td>Forte inflammation, taches de rougeur</td>
<td>Event. inflammation, rougeur</td>
<td>Rougeur, érosion</td>
<td>Tâches rouges irrégulières, soignements par contact</td>
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<tr>
<td>pH</td>
<td>&gt; 4.5</td>
<td>&gt; 4.5</td>
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<td>Cellules épithéliales recouvertes de bacilles (clue cells)</td>
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<td>Pathogènes</td>
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<td>Bactéries coliformes, coques ou chaînes</td>
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<td>Hyphes et spores de Candida</td>
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<td>Culture</td>
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<td>Diagnostic</td>
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<td>Symptômes et observations au microscope ou score AV</td>
<td>Présence de tableaux cliniques multiples</td>
<td>Symptômes et observations Mise en évidence de Candida</td>
<td>Symptômes et observations Mise en évidence de Trichomonas</td>
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<tr>
<td>Options thérapeutiques</td>
<td>Antinfectieux oraux ou vaginaux (Fluomizin®, métronidazole, clindamycine), restauration de la flore vaginale avec Gynofoor®</td>
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<td>Antinfectieux locaux ou oraux ou traitement local avec Fluomizin®, restauration de la flore vaginale avec Gynofoor®</td>
<td>Antinfectieux oraux, traitement simultané du partenaire sexuel, restauration de la flore vaginale avec Gynofoor®</td>
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</table>

Spectre d’activité antimicrobienne in vitro

1. Information professionnelle, Compendium Suisse des Médicaments, 2009

<table>
<thead>
<tr>
<th>Agents pathogènes</th>
<th>Substances</th>
<th>Chlorure de déqualinium</th>
<th>Cindamycine</th>
<th>Métronidazole</th>
<th>Hexéthine</th>
<th>Poivalone iodée</th>
<th>Clotrimazole</th>
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sensible | partiellement sensible | résistant | Absence de données
DISEASES CHARACTERIZED BY CERVICITIS AND PELVIC INFLAMMATORY DISEASE
CASE 4

- 18 y-o, usually healthy in stable relationship since 2y with a 28 y-o partner. Uses the pill. Since few weeks, greenish discharge and “burning” sensation “down there”.

Dyspareunie 7/10.
CASE 5

• 16+ y-o, presents with spotting since about 1-2 months with no associated pain, dyspareunia or dysmenorrhea. A febrile.
• Fixed boyfriend of 18 y-o for more than a year.
• On Seroquel; contraception: Implant
• Satisifed with her sexual relationship.
CERVICITIS

• Most complain of abN intermittent vaginal discharge/bleeding.
• PS- purulent or mucopurulent cervical discharge and/or cervical bleeding induced by probing of endocervical canal.
• *Chlamydia Trachomatis* (nonmotile, Gr Neg bacteria with obligate intracellular life cycle) or *Neisseria gonorrhoeae* (nonmotile nonspore-formimg, Gr Neg diplococci), isolated most frequently, but in most cases no organism isolated.
• Diagnosed by testing either urine or endocervical swabs. Does not R/O upper genital tract presence. PID 10%
• Adolescent girls should also be tested for BV and Trichomoniasis.
<table>
<thead>
<tr>
<th>Site of Infection</th>
<th>Clinical Syndrome N. gonorrhoeae</th>
<th>Clinical Syndrome C. trachomatis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urethra</td>
<td>Urethritis</td>
<td>Nongonococal urethritis</td>
</tr>
<tr>
<td>Epididymis</td>
<td>Epididymitis</td>
<td>Epididymitis — 70% of cases</td>
</tr>
<tr>
<td>Rectum</td>
<td>Proctitis</td>
<td>Proctitis</td>
</tr>
<tr>
<td>Conjunctiva</td>
<td>Conjunctivitis</td>
<td>Conjunctivitis</td>
</tr>
<tr>
<td>Pharynx</td>
<td>Pharyngitis — exudative</td>
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</tr>
<tr>
<td>Systemic</td>
<td>Disseminated gonorrhea</td>
<td>Reactive arthritis (urethritis, uveitis, sacroiliitis)</td>
</tr>
<tr>
<td></td>
<td>Arthritis-dermatitis syndrome</td>
<td></td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urethra</td>
<td>Acute urethral syndrome</td>
<td>Acute urethral syndrome</td>
</tr>
<tr>
<td>Bartholin gland</td>
<td>Bartholinitis</td>
<td>Bartholinitis</td>
</tr>
<tr>
<td>Cervix</td>
<td>Cervicitis</td>
<td>Cervicitis</td>
</tr>
<tr>
<td>Fallopian tube</td>
<td>Salpingitis</td>
<td>Salpingitis</td>
</tr>
<tr>
<td>Conjunctiva</td>
<td>Conjunctivitis</td>
<td>Conjunctivitis</td>
</tr>
<tr>
<td>Pharynx</td>
<td>Pharyngitis — exudative</td>
<td></td>
</tr>
<tr>
<td>Liver capsule</td>
<td>Perihepatitis</td>
<td>Perihepatitis</td>
</tr>
<tr>
<td>Systemic</td>
<td>Disseminated Gonorrhea</td>
<td></td>
</tr>
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<td></td>
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</tr>
</tbody>
</table>

Table 1
Clinical Manifestations of Gonorrhea and Chlamydia
CLINICAL MANIFESTATIONS

• Chlamydia is asymptomatic in 75% of women and 95% of men. Incubation period of 7-21 days.

• Gonorrhea is more frequently asymptomatic with variability depending on site of infection. Incubation period is 1-14 days.

• Only gonorrhea causes exudative pharyngitis
SYSTEMIC MANIFESTATIONS

• Gonorrhea includes disseminated disease (1%, 4:1 F:M ) and the arthritis-dermatitis syndrome: monoarticular septic arthritis of the knee (25%-50%) associated with a skin rash (90%). Pustular or petechial skin lesions occur on the extremities.

  Recovery of gonococcal organisms occurs most frequently from the pharynx or cervix rather than the joint fluid.

  Other associated presentations: arthralgias, tenosynovitis, perihepatitis, endocarditis, or meningitis.

• Chlamydia includes reactive arthritis (Reiter syndrome) characterized by uveitis, urethritis, dermatitis, and arthritis.
TREATMENT

• *Chlamydia Trachomatis*
  Azithromycin 1 gr or Doxycycline 100bid x 7d
  If Pregnant - Amoxicillin 500mg tid x 7d

• *Neisseria gonorrhoeae*
  Dual therapy – Ceftriaxone 250mg IM +
  Azithromycin 1 gr single dose or
  Doxycycline 100bid x 7d
PELVIC INFLAMMATROY DISEASE (PID)

• If untreated Chlamidia, GC and BV can lead to PID.

• PID occurs when genital tract infection > URT (endometritis ± salpingitis ±peritonitis).

• Sexually active females with pelvic pain and either cervical motion, adnexal, or uterine tenderness should be considered as having (PID).

Study showed that diagnosis based on clinical findings alone had an 87% sensitivity and a 50% specificity.

RISK FACTORS FOR PID

- A prior PID episode.
- Vaginal Douche
- 21 days after IUD insertion
Pelvic Inflammatory Disease

Sexually active woman presenting with abnormal vaginal discharge, lower abdominal pain, or dyspareunia

Uterine tenderness, OR Adnexal tenderness, OR Cervical motion tenderness on pelvic exam?

YES

1) Perform NAAT for gonorrhea and chlamydia
2) Perform pregnancy testing
3) Perform vaginal microscopy if available
4) Offer HIV testing

Empirical treatment for PID* if no other organic cause found (e.g., ectopic pregnancy, appendicitis)

NO

See Vaginal Discharge algorithm, consider other organic causes

Signs of severe illness (i.e., high fever, nausea/vomiting), OR Surgical emergency (e.g., appendicitis) not excluded, OR Suspected to have a tubo-ovarian abscess, OR Unable to tolerate or already failed oral antibiotics, OR Pregnant?

YES

Inpatient PID treatment:
Ceftriaxone 2g IM Q12 hours OR Cefotaxim 2g IV Q8 hours, PLUS Doxycycline 100mg PO Q12 hours** (other regimens available***)

NO

Outpatient PID treatment:
Ceftriaxone 2g IM x 1 dose PLUS Doxycycline 100mg PO BID x 14 days**, WITH OR WITHOUT Metronidazole 500mg PO BID x 14 days***

Cefotaxim 2g IM x 1 dose and Probenecid 1g PO x 1 dose together PLUS Doxycycline 100mg PO BID x 14 days**, WITH OR WITHOUT Metronidazole 500mg PO BID x 14 days***

(other regimens available****)

1) Hospitalize 24-48 hours to ensure response to treatment
2) Discharge on oral antibiotics to complete 14 day course

Response to treatment
72 hours later?

NO

See Inpatient treatment

YES

Continue treatment for 14 days

*Sex partners in past 60 days should be examined and treated empirically for gonorrhea or chlamydia, regardless of results of gonorrhea or chlamydia testing in index patient. If gonorrhea or chlamydia NAAT is positive, patient should have repeat screening (test of re-infection) in 3-6 months.
**Doxycycline not for use in pregnancy.
***Add metronidazole if bacterial vaginosis documented or unable to do vaginal microscopy.
****See 2010 CDC STD Treatment Guidelines for further details.
DISEASES CHARACTERIZED BY GENITAL ULCERATION
Differential Diagnosis of Genital Ulcers

- HSV-1 and -2
- Syphilis
- Chancroid
- Lymphogranuloma venereum
- Granuloma inguinale
- Aphthous ulcers
- Viral Infections such as adenovirus, CMV, 1° HIV, EBV or Coxsackie virus.
HERPES SIMPLEX VIRUS (HSV)

• With an increasing incidence throughout life, HSV-1 infection up to 60%-90% and HSV-2 20%-40% of the population (80% among HR populations), majority of infections being asymptomatic.


• Both HSV-1, predominantly extragenital, and HSV-2, predominantly anogenital, cause recurrent painful sores, which may be especially severe in those with a suppressed immune system. The incubation period is generally from 2 - 12 days, followed by viral shedding, regardless of symptoms, and by chronic infection of latent virus in the autonomic sensory ganglia (trigeminal for HSV-1 and sacral for HSV-2).
HERPES SIMPLEX VIRUS (HSV)

• Diagnosis often leads to psychological distress due to social stigma and the chronic nature of the disease.

• Classical signs include: red macules > vesicualr eruption. Lesion formation usually preceded by prodormal symptoms ± local paraesthesias, burning ± itching.

• Focus of therapy- symptoms reduction, prevention of recurrences and suppression of transmission.
**TREATMENT**

*First Episode* - Acyclovir 400 mg tid or 200 mg 5×/d × 7-10 d; or Famiciclovir 250 mg tid or Valacyclovir 1 g bid × 7-10 days

*Recurrent Episode* – Acyclovir 400 mg tid or 800 mg bid × 5 d
Acyclovir 800 mg tid × 2 days

Famiciclovir 125 mg bid × 5 d or 1 g bid × 1 d or 500 mg × 1
then 250 mg bid × 2 d

Valacyclovir 500 mg bid × 3 days or 1 g qd × 5 d

*Suppressive Therapy* – Acyclovir 400 mg bid; Famiciclovir 250 mg bid or Valacyclovir 500 mg qd or 1 g qd
Syphilis is a systemic disease caused by *Treponema pallidum* (spirochete bacteria): Several stages of progression: 1°, 2°, early latent (less than 1 y duration), late latent (>1 y duration), and 3°.

1° disease - *chancre, a painless ulcer* that increases the risk of HIV transmission and acquisition and leads to spread of the disease.

*Incubation* from transmission to the development of a chancre is *3 weeks -3 months.*
SYPHILIS

2° disease - transient rash which may include the palms and soles or mucosal lesions, lymphadenopathy, and a flu-like syndrome. Disease may be spread from mucous membrane contact or through sores.

3° disease - cardiac or ophthalmic lesions, auditory abnormalities, or gummatous lesions. CNS involvement can occur during any stage.

TREATMENT

Primary, Secondary, & Early Latent – Benzathine Penicillin G
2.4 million units IM × 1

Latent - Late & Of unknown duration – Benzathine Penicillin G
2.4 million units × 3 doses at 1 wk intervals

1°, 2°, Latent - if pregnant and PCN allergic, desensitize and treat

Neurosyphilis – Aqueous penicillin G 3-4 million units IV q 4 hrs × 10-14 d or 18-24 million units qd IV × 10 – 14 d

50,000 units/kg in children
CHANCROID

Usually occurs in discrete outbreaks and is characterized by a painful necrotizing genital ulcer and tender suppurative inguinal adenopathy caused by *Haemophilus ducreyi*.

The incubation period is from 1 – 14 days.

**TREATMENT**  Ceftriaxone 250mg IM or Azithromycin 1 gr single dose or Ciprofloxacin 500mg bid x 3d
LYMPHGRANULOMA VENEREUM (LGV)

Caused by *Chlamydia trachomatis* serovars L1, L2, or L3, predominantly infects the lymphatics, occurring in 3 stages.

LGV commonly presents with tender inguinal or femoral lymphadenopathy, which may become a suppurative granulomatous lymphadenitis (buboes), and may develop matting of the nodes or abscesses.

The initial stage of a self-limited genital ulcer or papule at the site of inoculation is frequently overlooked.

The third stage may occur years later, predominantly with rectal infections, where the lymphatic drainage may infect the perirectal or pelvic lymphatic system, causing abscesses, strictures, and fistulas. Incubation is from 3 days to 6 weeks.

LGV is predominantly found in Africa, India, and Southeast Asia.

It has been rare in US, increasing frequency in Europe (6:1 M:F).

**TREATMENT**  Erythromycin 500 mg qid or Azithromycin 1g po/week x21 jours
GRANULOMA INGUINALE

Endemic in some tropical and developing areas.

It presents with **painless, progressive, ulcerative lesions highly vascular** (beefy, red) and bleed easily on contact. Other variants may be **hypertrophic, necrotic, or sclerotic**.

It is a chronic bacterial infection characterized by Donovan bodies, caused by an intracellular Bacterium *Klebsiella granulomatis*.

**Chronic infection can lead to local destruction, lymphedema, and Carcinomas.**

**TREATMENT** Doxycycline 100 mg orally bid/
Azithromycin 1 g orally once per week/
Erythromycin base 500 mg orally qid x 21d
and until all lesions have completely healed.
HPV

The most prevalent viral STI.

• Risk factors identified as having a new male sex partner, taking oral contraceptives, and smoking.


• 100 different HPV viral types – 30 infect anogenital area. Classified according to oncogenic potential.

• LR type – anogenital condyloma and Low grade Cx dysplasia.

• HR type – High grade dysplasia and Cx cancer
HPV

HPV infection clear spontaneously within 2 years for the majority of young women.

Low-risk HPV-type lesions can develop between 3 weeks and 8 months after infection, with non-oncogenic types 6 and 11 causing greater than 90% of external genital warts.

High-risk HPV types (especially 16 and 18) may lead to persistent infection, a risk factor for cervical and anal dysplasia and cancer.
TREATMENT OF CONDYLOMAS

Patient-applied:
Imiquimod 5% cream qhs 3×/wk (may weaken condoms) or
Podofilox 0.5% sol’n/gel bid × 3 days each wk for 4 cycles or
Sinecatechins 15% ointment tid × 16 wks (may weaken condoms)

Provider-administered:
Cryotherapy q 1-2 wks or
Podophyllin resin 25% or Trichloroacetic acid (TCA) 90% or
Bichloroacetic acid (BCA) 90% applied q 1–2 wks or Surgery
(electrocautery, excision, laser, curettage)
PREVENTION OF STIs

• Prevention and control of STIs depend on early identification and treatment.

• Studies have shown that 14%-38% of adolescents are re-infected within 12 months after an initial Chlamydia infection. Re-infection was twice as likely among females who had resumed sexual activity with their partners, with most believing their partners had been treated.


• Ensuring that sexual partners are notified and treated reduces the risk of re-infection.
• Partner Notification - whereby the patient notifies his/her partner to seek care.

• Expedited Partner Therapy (EPT), whereby the provider refers the partner for treatment, without the requirement of clinical evaluation or laboratory testing.

• Patient-delivered partner therapy (PDPT) - supplies the required medication to their partner(s) through medication dispensed or prescribed by the patient’s health care provider for STI treatment.

↓ rates of persistent or recurrent GC and chlamydia infection, 
↑ increases the number of sex partners treated, and reaches partners unwilling or unable to seek medical care.
• EPT use is not recommended in women with trichomonas, because of a high risk of STD co-morbidity in partners, especially gonorrhea and chlamydia.

• Patients should encourage their partners to seek additional medical evaluation for other STI testing and advise; Symptomatic partners should seek a personal medical evaluation; this is particularly true for women with symptoms of PID.

• © Internet Sexuality Information Services (ISIS) a peer STD partner notification website first launched in the gay and bisexual community in San Francisco, has been replicated around the world with the support of health officials.
E-cards are used to notify partners anonymously, if desired, that they have been exposed
PREVENTION OF STIs BY PROTECTION

Correct and consistent use of male condoms protects against STIs:

- up to 85% reduction in HIV transmission;
- up to 70% reduction of HPV infections in females;
- up to 100% prevention of transmission of gonorrhea, chlamydia, and trichomonas, as well as HSV, syphilis, and chancroid when infected areas are covered.
Boys were significantly more likely to report having had sexual intercourse in around half of countries. The greatest gender disparity was observed in eastern European countries, Armenia and Greece. Higher prevalence among girls was reported in seven, mainly Scandinavian countries and the United Kingdom.
US Condom use at last sex had stabilized in sexually active adolescents at 60.2%.
PREVENTION OF STIs BY EDUCATION

Young people are using a variety of sources to answer their sexual and reproductive health questions:

• School
• Family - restricted by traditional gender roles
• friends - limited by the quality
• media - 70% TV; 50% magazines
• Internet- social media and mobile platforms
• Health professionals
TAKE HOME MESSAGE

• Prevention is always preferable to treatment.
• Partner notification/treatment is essential to prevent re-infection and disease spread.
• Condoms reduce risks of most, but not all, STIs.
• A past history of a STI – single best predictor of having subsequent STI.
TAKE HOME MESSAGE

• Cultures and serology should not used to guide treatments following exposure, but when available guide choice of treatment.
• Prompt diagnosis and therapy should signal the need to screen for other STIs.
• Global resistance patterns should be considered when choosing therapy.
• You can make the difference!