HUMAN BIOLOGY of SEXUALLY TRANSMITTED INFECTIONS

Organism	Disease Entities **Pathophysiology**	Diagnosis	Epidemiology	Treatment
URETHRITIS *and* MUCROPURULENT CERVICITIS				
GENERAL FEATURES **URETHRITIS** **Etiology** *N. goorrhoeae* and *C. trachomatis* (report to state PH) Gonococcal: profuse tinged exudates, severe dysuria, onset < 4 d. NSU: limited gray or clear exudates + mucous, intermittent and moderate dysuria, onset 7 – 14 d. DDx: *C. trachomatis*, *Ureaplasma biovar 2, Trachomatis vaginalis,* HSV, idiopathic **Diagnosis** Exudates Gm-stain: require ≥ 5 WBC per HPF Gonoccocal infection if intracellular GN diplococci Positive leukocyte esterase on first-void OR ≥ 10 WBC per HPF on first void **Treatment** TX for BOTH if no diagnostic tests available TX empirically if risk is high and improbable F/U TX all partners **MUCOPURELENT CERVICITIS** **Etiology** *N. goorrhoeae* and *C. trachomatis* **Diagnosis** Clinical: visualization of exudates on endocervix OR easy cervical bleeding **Presentation** Typically painless and asymptomatic				
Chlamydia trachomatis	**Mucopurlent Cervicitis** May spread subclinically throughout the adnexa	Gm stain of cervical or urethral swab: elevated WBC count with no organisms	**75% females asymptomatic** **50% males asymptomatic** Males more likely to seek treatment	**Screen**: annual test for females < 25 yrs AND > 25 with mutiple or new partners AND pregnant women NO screen for males

	Rectal Infection **Pharyngitis** **NSU** **Pelvic Inflammatory Disease (PID)** Occurs in 40 with untreated *C.t* Chronic pelvic pain, infertility, fatal ectopic Pregnancy **RF**: age (< 25 yrs), prior PID, number of Partners, IUD, alterations in flora **Presentation**: lower abdominal pain, dysparenuria, dysmenorrhea, exudates, dysuria Dx: cervical motion tenderness + adnexal or uterine tenderness **Increased risk of HIV infection and transmission** **Infection of epididymis** **Reactive arthritis** **Neonatal pneumonia and conjunctivitis** **RF:** cervical carcinoma (serotypes G, I, D), HIV infection, premature delivery	DFA ELISA Molecular analysis of urine or swabs: PCR Ligase Chain Reaction (LCR) Gold standard: tissue culture Bimanual exam and U/S for PID	TMX: all sexual activity, vaginal birth **RF:** number of partners, age (young females; due to immaturity of cervix)	**Tx** Azithromycin (bolus) OR Doxycycline (7 d.) Refer partners within 2 mos. Presumptive TX with gonoccoccal infection
Neusseria gonorrhoeae	**Gonoccocal Urethritis** Occurs within 4 d. of exposure Severe dysuria with tinged exudates **Rectal Infection** **Pharyngitis** (typically asymptomatic) In Females **Bartholin glandular abscess** **Perihepatitis**	Gm stain diagnostic in males: ≥ 5 WBC per HPF with intracellular GN diplococcic	**75% of males symptomatic** **Mainly asymptomatic in females** TMX: all sexual activity, vaginal birth May have relapsing infection	Uncomplicated gonococcal infections: Ceftriaxone IM (bolus) Treat *Chlamydia trachomatis* empirically if not R/O Refer partners within 2 mos. DGI: IV Ceftriaxone

	Due to extension of the infection from the ampulla of the R fallopian tube into the peritoneum **Pelvic Inflammatory Disease (PID)** In Males **Epididymitis** May result in infertility **Prastatitis** and resultant incontinence **Neonatal conjunctivitis, blindness, septic arthritis, sepsis** **DGI:** involvement of the joints + bacteremia Monoarticular arthritis Chills, fever, pustular rash, tenosynovitis Evaluate for endocarditis and meningitis **RF:** HIV infection, HIV transmission			PID: empiric broad-spectrum ABx therapy Cover *N. g*, *C. t*, anaerobes, GNOs, streptococci. + Tx male partners within 2 mos.
ULCERS				
General Features Non-infectious: trauma, erythema mutiforme (systemic), spermicide, drug exanthema (TMP-Sulfa, FQs) CLINICAL APPROACH In U.S: genital herpes > syphilis > chancroid Screen all pts for syphilis + Ag test for HSV Treat empirically before definitive Dx				
Genital Herpes (HSV-1, HSV-2)	(This is a recurrent lifelong infection) **Primary eruption** Occurs < 2 wks after TMX Healing within 2 – 4 wks	Confirm all Dx with laboratory testing	HSV-2 > HSV-1 Most infection in asymptomatic Recurrence rate is lower for HSV-1	Screening: not indicated in general population

	Associated with flu-like syndrome (fever, lymphadenopthy) (This occurs in the minority of cases!) **Recurrent eruptions** Recurrence rate decreases with time (typically 4 -5 per year) **Neonatal Herpes** Occurs if mother has **active ulcers** at time of delivery **RF:** infection during pregnancy (especially in second half of first pregnancy) Most infection results from recurrent infection	**Virologic Tests** Isolation in cell culture wfrom base of active ulcer Ag detection: may not distinguish between serotypes Direct Fluorescent Ab: specific PCR: detect virus in CSF Cytologic (Tzanck prep and PAP): not sensitivity or specific These CANNOT be used for Dx **Serologic Tests** Anti-HSV2: suggests genital infection Abs to glycoprotein G2 Anti-HSV1: does not distinguish between gingovostomatitis or genital infection Abs to glycoprotein G1	**HSV-2 is more common in females** Thus, there is a differential in efficacy of TMX (easier to transmit from male to female)	**Antiviral Therapy** Primary Genital Herpes Recurrence: suppressive therapy (reduces frequency) or episodic (palliation and decrease duration) Suppressive: indicated for frequent recurrent (≥ 6 per yr) Does not eliminate subclinical shedding, but reduces TMX Acyclovir Valacyclovir Famciclovir Topical therapy is NOT effective
Syphilis (*Treponema pallidum*)	The lesions are not recognized during the primary and secondary stages (during which most TMX occurs) **Primary Stage** Single chancre developing 10 – 90 d. after infection (site of entry) Firm, small, **painless** lesion Heals within 3 – 6 wks **Secondary Stage** Manifests **2 – 8 wks after resolution** of the primary chancre Non-pruritic rash Erythemaous papules on palms and soles Fever, pharyngitis, lymphadenopathy, alopecia, headaches, weight loss, myalgias, fatigue	Darkfield microscopy DFA on lesion exudates and Gx **Serologic Tests** **NON-TREPONEMAL** VDRL and RPR Reported as fold-dilution titre Requires > 4-fold increase for significance Typically becomes amnestic with time but may maintain detectable titre (serofast reaction) **TREPONEMAL** Fluorescent Treponemal Ab Seropositive status is stable with 15 – 25% conversion rate to undetectable titre at 2 – 3 yrs	TMX: direct contact with syphilis lesion (primary and secondary syphilis), pregnancy	**Screen: HIV infection** **Tx** Primary, Secondary, Latent, Tertiary: PCN G Benzathine Neurosyphilis IV PCN G Jarisch-Herzheimer reaction: febrile illness immediately following initiation of ABx therapy Associated with **early** syphilis

	Late Stage Occurs with resolution of secondary syndrome Dissemination into CNS, peripheral nerves, eyes, myocardium, vessels,liver, bones Incoodination, paralysis, numbness, blindness, dementia **RF:** HIV infection and TMX (with primary chancre; RR = 2 – 5), stillbirth, neonatal infection with rapid mortality **Neurosyphilis** May occur at any stage of the disease	DO NOT use titre to track response to Tx **CSF detection** VDRL-CSF: high specificity, low sensitivity Virtually diagnostic of syphilis FT Ab – CSF: high sensitivity, low specificity CSF leukocyte count ≥ 5 cells/mL in neurosyphilis can be used to track Tx		
Chancroid (*Haemophilus ducreyi*)	**Genital Lesions** Painful genital papules surrounded by erythema → rapid conversion to pustules → erosions and ulceration; lesions are fluctuant with undermined border → tender inguinal lymphadenopathy (1 wk. after onset) → spontaneous rupture **RF:** HIV TMX	ID *H. ducreyi* on culture media Painful ulcer + inguinal node + supperative adenopathy This is virtually diagnostic of chancroid	Occurs in discrete epidemics within U.S	Primary lesions: azithromycin, ceftriaxone, ciprofloxacin, erythromycin Node: drainage
Granuloma Inguinale (Donovanosis) (*Calymmatobacterium granulomatis*)	**Genital Ulcer**	Intracellular GNO	Rare in U.S Endemic in tropical areas and devlopign countries	
Lymohaogranuloma Venereum (*Chlamydia trachomatis* serovars L1, L2, L3)	**Tender inguinal and femoral lymphadenopathy** Typically unilateral **Proctocolitis**			

	Lymphadenitis Inflammation of perirectal and perianal lymphatics → fistulas and strictures			
OTHER INFECTIONS				
HPV	**Verucous Warts** HPV serotypes 6, 11 **Premaliganant transformation of squamous epithelium** **Cervical carcinoma** HPV serotypes 16, 18	**PAP** Colposcopy Bx Acetowhite staining HPV PCR Minor PAP abnormalities or > 30 Yrs May be used in males. Screening not recommended.	TMX: sexual contact, vaginal delivery Most infection is asymptomatic	Podofilox Imiquimod Cryotherapy Ablation IFN HPV vaccine
Trichomoniasis (*Trichomonas vaginalis*)	**Urethritis (Males)** Dysuria, exudates **Vaginosis** Frothy tinged exudates Malodorous Pruritis, dysparenuria, dysuria **RF:** HIV infection, HIV TMX, low birth weight, premature delivery	**Wet mount**: motile organism (difficult to detect in men) Females: inspection reveals red ulceration on vaginal mucosa and cervix	Curable STI in young females TMX: females may be infected during sexual contact with both males and females; males infected by females only	Metronidazole
Bacterial Vaginosis (BV)	Etiology: disturbance in normal vaginal flora **RF:** new partner, multiple partners, IUD, cleansing Malodorous exudates Typically thin and clear or gray Dysuria Pruritis	Wet mount and Gm-stain: **Clue cells** pH of exudates < 4.5 **Positive whiff test**: add 10% KOH → amine odor	Most common vaginal infection	**Screen**: all women with Hx of premature delivery or prior pregnancy with low birth weight Metronidazole OR clindamycin Tx all pregnant women

	RF: HIV infection, HIV TMX, development of PID after pelvic surgery (hysterectomy, abortion) , other STIs (gonorrhea, Chlamydia)			
Ectoparasites (Pediculosis Pubis, Scabies)	**Pediculosis Pubis** Infestation of pubic hair			Topical permethrin Decontaminate clothing and sheets Screen: other STIs Tx: all partners within 1 mo.