Review and Update – UTIs and STIs

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Learning Objectives

• List differential diagnoses for urethritis/cervicitis.
• Identify dermatologic manifestations of sexually-transmitted infections (STIs).
• Summarize current treatment recommendations for STIs and urinary tract infections (UTIs).
• Describe possible sequelae from untreated infections.
• Recognize and avoid certain language that may discourage patient openness in discussing sexual health.
What this presentation is...

• Case-based review of diagnosis of most STIs and UTIs with current treatment guidelines (CDC 2015, ISDA 2011, EAU 2015).
What this presentation is not...

• Screening recommendations
• Treatment after sexual assault
• HIV or Hepatitis A/B/C
• Immunizations or prophylaxis against STIs (e.g., Gardasil, Truvada)
• Cervical or testicular cancer
Part 1:
Let’s talk about sex, baby
Epidemiology

- The US has the highest rate of STIs in the industrialized world
  - Approximately 20 million new cases annually
  - This costs the healthcare system $16 billion each year
- Between 2003 and 2017, there has been:
  - 196% increase in cases of syphilis
    - Highest rates (2017) Nevada, California, and Louisiana
  - 66% increase in cases of gonorrhea
    - Highest rates (2017) in the South (and Alaska!), but increasingly in the Southwest
  - 95% increase in cases of chlamydia
- In 2018, England saw its first case of drug-resistant gonorrhea
Case #1: Appropriate language

• Charlie, a 38 year-old Caucasian transgender man, presents to the Emergency Department for lower abdominal pain.

• His medical record does list his preferred name, but also indicates his gender as female.

• How would you approach this situation?

• How might you evaluate his need for a urine pregnancy test and/or pelvic exam?
Eliciting a sexual history

- Make sure the patient is comfortable with anyone who may be in the room
- Use **open-ended questions** and **neutral words** that avoid implied judgment or a “correct” answer (e.g., rather than, “Do you use condoms?,” ask, “What do you do to keep yourself safe when you have sex?”)
- **Normalizing language**, taking the focus off the individual a bit, may also be helpful (e.g., “Some people worry about whether a particular symptom means they have a sexually-transmitted infection. Where do you go for information?”)
The 5 P’s

• Partners
  • Gender and number of partners

• Practices
  • Condom usage
  • Oral, vaginal, and anal sex

• Protection from STIs

• Past history of STIs
  • Last STI testing (if ever)
  • Exposures to STIs
  • Other risks (e.g., IVDU, involvement in the sex trade)

• Pregnancy
  • Other forms of birth control
Word choice matters

- **Sex** – assignment based on genetics (XX, XY) and/or anatomic features at birth
- **Cisgender** – those whose gender identity and/or expression align with cultural expectations of assigned birth sex
- **Transgender female (MTF)** – biologic male whose gender identity is female
- **Transgender male (FTM)** – biologic female whose gender identity is male
- **Nonbinary** – those who do not identify as either male or female (can identity with both, neither, or a combination); may call themselves queer, agender, or genderfluid
Avoid assumptions

- Gender identity/expression ≠ sexual orientation/practice
- Sexual practice may change over time
- Orientation ≠ practice
- One risk does not necessarily beget another
- Avoid heteronormative questions and, separately, “slut shaming” (criticizing someone for falling outside of societal expectations regarding sex, or the perception of such)

- *When in doubt, ask for clarification* (e.g., “Can you explain that to me?”)
Slang changes

• In the 17th century, people might fadoodle, put the devil into hell, dance the Paphian jig, play at rantum-scantum, join giblets, lerricompoop, or ride a dragon upon Saint George.

• Now we have side chicks and cougars, pitchers and catchers, bugchasers and serosorters, pegging and parTying, bears and chickenhawks. We swipe right and hope to get to third base; we send text messages asking, “DTF?” or “Netflix and chill?”
Part 2:
The birds and the b(acteria)s
Case #2a: Dysuria

• Natasha, a 20 year-old African-American woman, presents to your Urgent Care with the chief concern of dysuria.
• She endorses suprapubic pain and pressure, as well as urinary urgency and frequency.
• She denies gross hematuria, vaginal discharge, or flank pain.
• Her last menstrual period (LMP) was 2 weeks ago. She is not sexually active.

• What’s your differential?
• How would you further evaluate her symptoms?
Diseases of the urinary tract (♀)

- Urinary tract infection (UTI)
- Interstitial cystitis (IC)/bladder pain syndrome (BPS)
- Hemorrhagic cystitis
- Pyelonephritis
- Nephrolithiasis

- Gonorrhea (GC)
- Non-gonococcal urethritis (NGU)
  - Chlamydia (CT)
  - Mycoplasma/ureaplasma
  - Trichomonas
  - Herpes simplex virus
Workup for dysuria

- **POC urinalysis** ("clean catch" sample) reveals:
  - 1+ leukocyte esterase, positive nitrates, and trace blood
- **Urine culture** pending (and will likely return within 3 days).
- Urine pregnancy test negative.
- Urine GC/CT not sent.

- *Is this UTI complicated or uncomplicated?*
- *How would you treat this patient?*
Symptomatic uncomplicated UTIs

- Gram-negative aerobic bacteria (e.g., *E. coli*) most common; gram-positive bacteria (e.g., *Staph saprophyticus*) possible

- Treatment of *uncomplicated* UTIs:
  - Trimethoprim-sulfamethoxazole (TMP-SMX) 160/800mg (Bactrim DS), 1 tab PO BID x3d
  - Nitrofurantoin (Macrobid) 100mg PO BID x5-7d
  - Fosfomycin 3g PO x1
  - Ciprofloxacin (Cipro)* 250mg PO BID x3d
  - Amoxicillin/clavulanate (Augmentin)* 500/125mg PO BID x3-7d
  - Cephalexin (Keflex)* 500mg PO BID x3-7d
Complicated UTIs/pyelonephritis

• Complicated UTIs = persistent, recurrent, or predisposition to infection or treatment failure
  • Recurrent UTIs (≥3/y) may warrant daily or post-coital antibiotic prophylaxis

• Treatment of complicated UTIs:
  • Trimethoprim-sulfamethoxazole (TMP-SMX) 160/800mg (Bactrim DS), 1 tab PO BID x3-14d
    • For severe infections, TMP-SMX 8-10mg/kg/day TMP PO divided q6-12h x14d
  • Ciprofloxacin (Cipro)* 500mg PO BID x7-14d
    • Alternative = ciprofloxacin 400mg IV q12h x7-14d
## Classification of UTIs

<table>
<thead>
<tr>
<th>Severity</th>
<th>Gradient of severity</th>
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<tbody>
<tr>
<td>No symptoms</td>
<td>Local symptoms</td>
</tr>
<tr>
<td>Dysuria, frequency, urgency, pain or bladder tenderness</td>
<td>General symptoms</td>
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<tr>
<td>Fever, Flank pain, Nausea, vomiting</td>
<td>Systemic response</td>
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<tr>
<td>SIRS, Fever, shivering, Circulatory failure</td>
<td>Circulatory and organ failure</td>
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<tr>
<td>Organ dysfunction, Organ failure</td>
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### Diagnosis

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<tbody>
<tr>
<td>Dipstick (MSU Culture + S as required)</td>
<td>Dipstick MSU Culture + S Renal US or I.V. Pyelogram /renal CT</td>
<td>Dipstick MSU Culture + S and Blood culture Renal US and/or Renal and abdominal CT</td>
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### Investigations

- Risk factor assessment according to ORENUC (Table 1)

<table>
<thead>
<tr>
<th>Medical and surgical treatment</th>
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<tbody>
<tr>
<td>Uncomplicated UTI</td>
</tr>
<tr>
<td>NO*</td>
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* Two presently accepted exceptions: during pregnancy and prior to urological surgery.
Other situations

• Asymptomatic bacteriuria (ASB) +/- pyuria
  • May be more common in older adults, but screening and treatment generally not recommended (pregnant women)

• Pregnant women
  • Avoid TMP-SMX and fluoroquinolones

• Children
  • 3rd generation cephalosporins preferred

• Elderly
  • Vaginal atrophy may contribute to recurrent UTIs

• Renal impairment
  • Adjust dose based on creatinine clearance
  • Do not use nitrofurantoin
Case #2b: Urethral discharge

• Humberto, a 24 year-old Latino man, presents to your STI clinic with the chief concern of dysuria and penile discharge.
• He reports mild testicular discomfort.
• He denies other urinary symptoms.
• He is uncircumcised and engages in unprotected vaginal intercourse with several female partners.

• What’s your differential?
• How would you further evaluate his symptoms?
Diseases of the urinary tract (♂)

- Similar differential diagnosis as before, but with some anatomic differences:
  - UTI may be less likely due to length of urethra
  - The prostate gland may be involved (*prostatitis*)
  - The glans penis and/or foreskin (prepuce) may also be involved (*balanoposthitis*)
Workup for urethral discharge

- Physical exam reveals scant creamy, off-white penile discharge with mild urethral inflammation. No rash or genital lesions. Mild generalized testicular discomfort with palpation. Cremasteric reflex is intact.
- Empiric treatment discussed, but patient declines. He is advised to refrain from sexual contact until his urine GC/CT tests (“dirty urine” sample) return.
- 3 days later, the labs reveal infection with gonorrhea.

How would you treat his infection?
Gonorrhea (GC)

• *Neisseria gonorrhoeae*

• Treatment for uncomplicated genital, rectal, or pharyngeal infections includes dual therapy with ceftriaxone 250mg IM x1 and azithromycin 1g PO x1. This regimen can also be used in pregnant women.

• Untreated, GC can cause epididymitis, infertility, pelvic inflammatory disease (PID), or disseminated gonococcal infection (DGI). It can also increase one’s risk of acquiring or transmitting HIV.
Unlucky twins

• Humberto’s twin brother Arturo reports similar symptoms (dysuria, penile discharge, and testicular pain), but his testing reveals *chlamydia*.

• *How is his treatment different?*
Chlamydia (CT)

- *Chlamydia trachomatis*
- Treatment for *uncomplicated genital or pharyngeal infections* consists only of azithromycin 1g PO x1. This regimen can also be used in pregnant women.
  - Alternative = doxycycline 100mg PO BID x7d
    - *not* for pregnant women, preferred for *rectal* infection

- *C. trachomatis* can also cause *lymphogranuloma venereum (LGV)*, which manifests as genital papules or ulcers and inguinal lymphadenopathy. It is rare in industrialized countries. Treatment: doxycycline 100mg PO BID x21d.
Expedited partner therapy (EPT)
Case #2c: Vaginal discharge

- Rangi, a 21 year-old woman of South Pacific Islander heritage, heard about Arturo’s infection and presents to your STI clinic with the chief concern of malodorous vaginal discharge.
- She denies vaginal pain or bleeding.
- She engages in unprotected vaginal intercourse with male and female partners.

- What’s your differential?
- How would you further evaluate her symptoms?
Diseases of the vagina/cervix

- Gonorrhea (GC)
- Chlamydia (CT)
- Trichomonas
- Mycoplasma/ureaplasma
- Bacterial vaginosis (BV)
- Candidia

- Syphilis
- Chancroid
- Herpes simplex virus (HSV-1/-2)
- Human papillomavirus (HPV)
Workup for vaginal discharge

• Pelvic exam reveals fishy-smelling, tacky grey vaginal discharge with positive “whiff test.”
• Wet prep (saline) reveals clue cells. KOH prep shows neither spores nor pseudohyphae.

• *Could any other tests have been performed?*
• *How would you treat this patient?*

• *What if her exam/testing had different findings?*
Bacterial vaginosis (BV)

- Imbalance of vaginal flora, but associated with *Gardnerella vaginalis*

- Many treatment options:
  - Metronidazole 500mg PO BID x7d
  - Metronidazole gel 0.75% one applicator (5g) PV daily x5d
  - Clindamycin cream 2% one applicator (5g) PV qhs x7d
  - Tinidazole 2g PO daily x2d
  - Tinidazole 1g PO daily x5d
  - Clindamycin 300mg PO BID x7d
  - Clindamycin ovules† 100mg PV qhs x3d
Candidiasis

- *Candida albicans* → candidiasis
  - Thick, white curd-like vaginal discharge
  - Superficial candidial skin infections usually feature a hot, itchy, and/or painful flat red rash
  - Multiple treatment options, including fluconazole 150mg PO x1 or terconazole 80mg PV daily x3d
Trichomoniasis

• *Trichomonas vaginalis* → trichomoniasis
  • May be asymptomatic or present with vaginal discharge (malodorous, purulent, frothy), vaginal odor, and/or itch
  • Treatment options include metronidazole 2g PO x1‡ or tinidazole 2g PO x1
    • Persistent or recurrent infections may be treated with metronidazole 500mg PO BID x7d
# Vaginitis

<table>
<thead>
<tr>
<th></th>
<th>Bacterial vaginosis</th>
<th>Candidiasis</th>
<th>Trichomoniasis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms</strong></td>
<td>Odor, itch, discharge</td>
<td>Itch, thick discharge, dysuria, discomfort</td>
<td>Often asymptomatic; itch, discharge</td>
</tr>
<tr>
<td><strong>Vaginal discharge</strong></td>
<td>Adherent, thin, milky-white, “fishy”</td>
<td>Thick, clumpy, white “cottage cheese”</td>
<td>Frothy, grey or yellow-green, malodorous</td>
</tr>
<tr>
<td><strong>Saline wet mount</strong></td>
<td>Clue cells, no/few WBCs</td>
<td>WBCs (few to many)</td>
<td>Motile flagellated protozoa, many WBCs</td>
</tr>
<tr>
<td><strong>KOH wet mount</strong></td>
<td></td>
<td>Pseudohyphae, budding yeast</td>
<td></td>
</tr>
<tr>
<td><strong>KOH “whiff test”</strong></td>
<td>Positive</td>
<td>Negative</td>
<td>Often positive</td>
</tr>
</tbody>
</table>

CDC (2013)
Other causes of, and treatments for, vaginal discharge

- *Mycoplasma genitalium*
  - New/emerging pathogen
  - Less common than CT but more common than GC; coinfection with chlamydia not uncommon
  - Current treatment is azithromycin 1g PO x1, but there may be increasing resistance/declining efficacy

- *Mycoplasma hominis*
  - Doxycycline 100mg PO BID x7-14d

- *Ureaplasma urealyticum*
  - Doxycycline 100mg PO BID x7-14d
  - Macrolides like azithromycin or fluoroquinolones like moxifloxacin may be alternatives
Part 3: The skin you’re in
Case #3a: Genital itch

• Pooja, a 30 year-old South Asian transgender woman, presents to your Urgent Care with the chief concern of itching in the genital area.
• She denies new soaps, detergents, clothing, etc.
• She reports taking estrogen hormonal therapy and has not had vaginoplasty.

• *What else would you want to know?*
• *What’s your differential?*
Diseases of the (genital) skin

- Candidiasis
- Tinea cruris/corporis
- Pubic lice (pediculosis pubis)
- Scabies
- Herpes simplex virus
- Anogenital warts (HPV)
- Molluscum contagiosum
- Syphilis
- Chancroid
- Donovanosis (granuloma inguinale)
Tinea

- *Trichophyton rubrum, T. mentagrophytes* → tinea cruris
  - Treatment consists of topical antifungals like terbinafine, clotrimazole, and ketoconazole applied BID x10-14d
  - Itraconazole 200mg PO daily or terbinafine 250mg PO daily x3-6 weeks may be used for refractory cases
Pubic lice

- *Phthirus pubis* → pubic lice (pediculosis pubis)
  - Permethrin 1% cream or pyrethrins with piperonyl butoxide applied to affected areas and washed off after 10min
  - Alternative treatments include malathion 0.5% lotion applied to affected areas and washed off after 8-12h or ivermectin 250 μg/kg PO x1 and repeated after 2 weeks
Scabies

- *Sarcoptes scabiei* → scabies
  - Permethrin 5% cream applied from the neck down and washed off after 8-14h or ivermectin 200 μg/kg PO x1 and repeated after 2 weeks (not for use in children <10yo)
  - Lindane 1%, an alternative treatment, is not for use in children and may be banned/restricted in some areas due to toxicity
Case #3b: Genital bumps

• Saahirah, a 35 year-old woman of Middle Eastern heritage, presents to your Urgent Care with the chief concern of bumps on her genital tissue.
• She denies having had this issue before. She denies ulcers.
• She is married and monogamous. She does not suspect her husband of extramarital affairs.

• What else would you want to know?
• What’s your differential? (What’s more likely now?)
Diseases of the skin (revisited)

- Herpes simplex virus
- Anogenital warts (HPV)
- Molluscum contagiosum
- Syphilis
- Chancroid
- Donovanosis (granuloma inguinale)

- Pubic lice (pediculosis pubis)
- Scabies
- Candidiasis
- Tinea cruris/corporis
Genital herpes: testing and types

- Limitations of testing for herpes simplex virus (HSV-1/-2):
  - Swab can only be done for an active lesion; relatively high rate of false negatives (especially if lesion small or already healing)
  - Blood test may be difficult to interpret; though IgM appears first, only IgG tests can distinguish between HSV-1 and -2

- Treatment dosage and duration depends on the number and frequency of outbreaks; topical analgesia should be offered

- Cold sores (herpes labialis) and mat herpes (herpes gladiatorum) are typically caused by HSV-1 and treated differently
Genital herpes: treatment

• WHO (2016) favors acyclovir over valacyclovir or famciclovir (but their guidelines use a lower dose of valacyclovir)

• First episode:
  • Valacyclovir 1g PO BID x7-10d
  • Acyclovir 400mg PO TID x7-10d
  • *Treatment may be extended if healing incomplete after 10d*

• Recurrence (episodic outbreaks):
  • Valacyclovir 500mg PO BID x3d
  • Acyclovir 800mg PO BID x5d

• Daily suppressive (if >4-6 outbreaks/yr or severe symptoms):
  • Valacyclovir 1g PO daily
  • Acyclovir 400mg PO BID
Human papillomavirus (HPV)

- Human papillomavirus (HPV) → anogenital warts
  - Soft, moist, raised (sometimes pedunculated) polyps that may cause itching, burning, or discomfort
  - Cryotherapy or surgical removal (e.g., shave, curettage, laser) or trichloracetic acid (TCA) or bichloracetic acid (BCA) 80-90% solution
  - Patient-administered treatment options for external warts include:
    - Imiquimod 3.75-5% cream† or
    - Podofilox 0.5% solution or gel or
    - Sincatechins 15% ointment†
Molluscum contagiosum

- Molluscum contagiosum (poxvirus)
  - Smooth, small (2-5mm in diameter) papules, usually in clusters and with a central umbilication
  - Treatment can also be through mechanical methods or topical irritants
Case #3c: Genital ulcers

• Quinn, a 42 year-old Caucasian man, presents to your STI clinic for evaluation of a painless ulcer on his penis.
• He reports practicing unprotected anal penetrative and receptive intercourse with male partners.

• What else do you want to know about his symptoms?
• What’s your differential?
• How would you further evaluate his symptoms?
Diseases of the skin (revisited)

- Herpes simplex virus
- Syphilis
- Chancroid
- Donovanosis (granuloma inguinale)
- Anogenital warts (HPV)
- Molluscum contagiosum

- Pubic lice (pediculosis pubis)
- Scabies
- Candidiasis
- Tinea cruris/corporis
Workup for syphilis

• *Treponema pallidum*

• Syphilis serology:
  • Nontreponemal tests (e.g., VDRL, RPR)
    • Screening test in the “classical” testing algorithm
  • Treponemal tests (e.g., FTA-ABS, TP-PA)
    • Detect antibodies specific for syphilis
    • *Treponemal antibodies remain detectable even after successful treatment*
### Syphilis: progression

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
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</table>
| Primary        | • Painless ulcer(s) lasting 3-6 weeks  
• Frequently associated with localized nontender LAD                                      |
| Secondary      | • Nonpruritic rash (rough spots) on palms/soles while primary chancre is healing, or several weeks later  
• Nonspecific symptoms such as fever, HA, LAD, sore throat, patchy hair loss, weight loss, myalgias, and fatigue |
| Latent         | • Early latent syphilis = infection within previous 12 months  
• Late latent syphilis = infection more than 12 months ago                                        |
| Tertiary       | • Variable presentation affecting heart, liver, kidneys, and bones/joints  
• Appears 10-30 years after initial infection; can be fatal                                      |
| Neurosyphilis  | • When bacterium enters nervous system; can occur at any stage  
• Symptoms include altered behavior, dementia, ataxia, and paralysis  
• Ocular syphilis can lead to blindness                                                             |
Syphilis: progression (con’t)

a. Chancre (1° syphilis)
b. Syphilitic dermatitis (2° syphilis)
c. Gumma (late/3° syphilis)
Syphilis: treatment

- Primary, secondary, and early latent syphilis (<1y)
  - Benzathine PCN G 2.4 M units IM x1
- Late latent syphilis (or latent syphilis of unknown duration) and tertiary syphilis
  - Benzathine PCN G 2.4 M units IM weekly x3 (i.e., 7.2 M units total)
- Neurosyphilis and ocular syphilis
  - Aqueous crystalline PCN G 18-24 M units/day (3-4 M units IV q4h or continuous infusion) x10-14d
Genital ulcer diseases (GUD)

- *Hemophilus ducreyi* → chancroid
  - Papules, painful ulcers, and suppurative inguinal lymphadenopathy
  - Azithromycin 1g PO x1 or ceftriaxone 250mg IM x1 or ciprofloxacin 500mg PO BID x3d or erythromycin base 500mg PO TID x7d

- *Klebsiella granulomatis* (formerly *Calymmatobacterium granulomatis*) → donovanosis (granuloma inguinale)
  - Rare in the US; beefy-red bumps give way to nodules and erosion of genital/anal tissue
  - Azithromycin 1g PO weekly x3+ or azithromycin 500mg PO daily x21+ (and until all lesions have completely healed)
Part 4:
Take me home, country roads
## Infections by class

<table>
<thead>
<tr>
<th>Bacterial</th>
<th>Viral</th>
<th>Fungal</th>
<th>Parasitic</th>
</tr>
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<tbody>
<tr>
<td>Chlamydia</td>
<td>HSV-1/-2</td>
<td>Candidiasis</td>
<td>Trichomonas</td>
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<tr>
<td>Gonorrhea</td>
<td>HPV</td>
<td>Tinea</td>
<td>Pubic lice</td>
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<tr>
<td>Syphilis</td>
<td>Molluscum contagiosum</td>
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<td>Scabies</td>
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<td>Chancroid</td>
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<td>Mycoplasma</td>
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<td>Ureaplasma</td>
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<td>BV</td>
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<tr>
<td>UTIs/Pyelo</td>
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<tr>
<td>Donovanosis</td>
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Complications and their treatment

- **Lymphogranuloma venereum (LGV):** doxycycline 100mg PO BID x21d
- **Disseminated gonococcal infection (DGI):** ceftriaxone 1g IM/IV daily x7d [or more] + azithromycin 1g PO x1
- **Cervicitis:** azithromycin 1g PO x1 or doxycycline 100mg PO BID x7d
  - Same as treatment for **nongonoccal urethritis (NGU)**
- **Pelvic inflammatory disease (PID):** ceftriaxone 250mg IM x1 + doxycycline 100mg PO BID x14d +/- metronidazole 500mg PO BID x14d
- **Epididymitis:** ceftriaxone 250mg IM x1 + levofloxacin 500mg PO daily x10d
- **Proctitis:** ceftriaxone 250mg IM x1 + doxycycline 100mg PO BID x7d
Take-home points

• There is substantial overlap in symptoms for STIs and UTIs, but infections may also be *asymptomatic*.

• Recommended treatment may differ based on various factors, and not all professional guidelines agree. When in doubt, consult a specialist.

• Similarly, be familiar with the laws in your place of practice, with regard to treatment of minors, EPT, etc.

• Patients can sense when you’re nervous. Normalize sensitive questions for you and for them.
References


References (con’t)


• Kuehn BM. A Proactive Approach Needed to Combat Rising STIs. *JAMA*, 2019; e1-3. [published online]


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• http://www.ncsddc.org/resources/
• https://www.infectiousdiseaseadvisor.com/
• http://www.ashasexualhealth.org/sexual-health/