Pelvic Infection Detective Training

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Objectives:

1. Broaden the differential of pelvic infections and pelvic pain
2. Learn detailed anatomy to help in evaluation and treatment
3. Recognize symptoms
4. Clinical and laboratory evaluation
5. Treatment

The Pelvis!

- The pelvis is complex.
- Pelvic pain can originate from the internal organs, muscles, tissue level and spine.
- Understanding the complexity of the pelvis helps evaluation.

The Pelvis

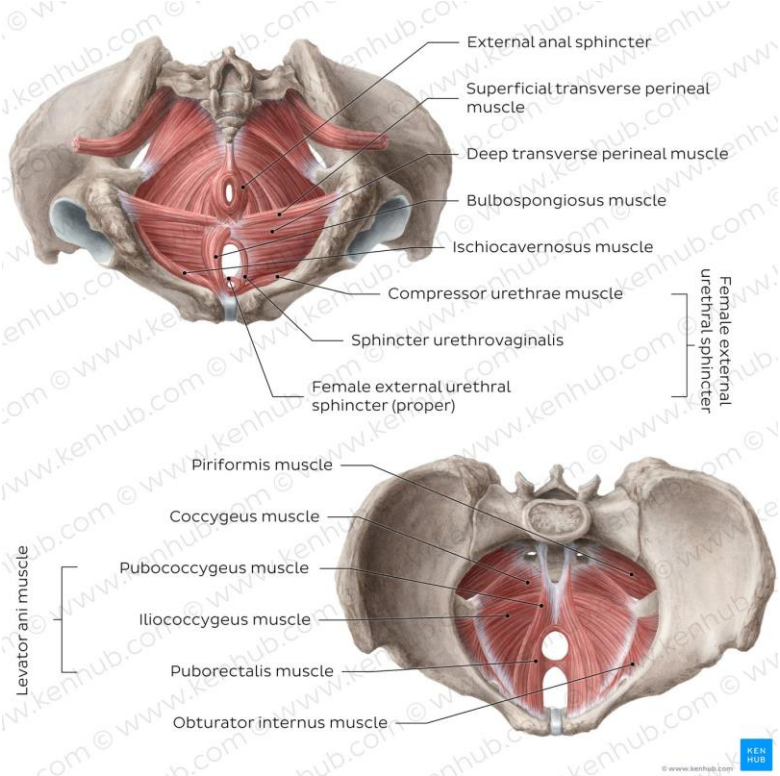
Pelvis: Trunk region between the abdomen and the lower limb

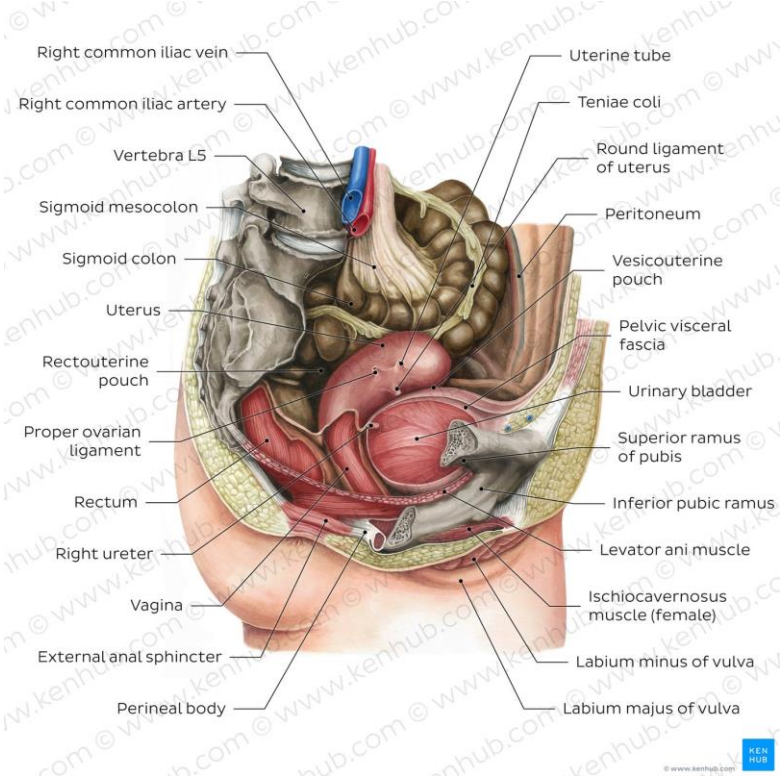
Viscera: ureter, urinary bladder, urethra, terminal ileum, sigmoid colon, rectum, anus, internal genitalia, external genitalia

Vessels: internal iliac artery, gonadal arteries, median sacral artery, superior rectal artery

Nerves: lumbar plexus, sacral plexus, coccygeal plexus, splanchnic nerves

The Pelvis


External anal sphincter
Superficial transverse perineal muscle
Deep transverse perineal muscle
Bulbospongiosus muscle
Ischiocavernosus muscle
Compressor urethrae muscle
Sphincter urethrovaginalis
Female external urethral sphincter (proper)
Female external urethral sphincter
Piriformis muscle
Coccygeus muscle
Pubococcygeus muscle
Iliococcygeus muscle
Puborectalis muscle
Obturator internus muscle
Levator ani muscle


Right common iliac vein
Right common iliac artery
Vertebra L5
Sigmoid mesocolon
Sigmoid colon
Uterus
Rectouterine pouch
Proper ovarian ligament
Rectum
Right ureter
Vagina
External anal sphincter
Perineal body
Uterine tube
Teniae coli
Round ligament of uterus
Peritoneum
Vesicouterine pouch
Pelvic visceral fascia
Urinary bladder
Superior ramus of pubis
Inferior pubic ramus
Levator ani muscle
Ischiocavernosus muscle (female)
Labium minus of vulva
Labium majus of vulva

The Pelvic floor muscles & diaphragm:

Pelvic diaphragm: two paired muscles and their fasciae; levator ani muscle & coccygeus muscle

Function: support the pelvic organs and prevent them from prolapse.

Levator ani: puborectalis, pubococcygeus and iliococcygeus

Coccygeus: flexes coccyx

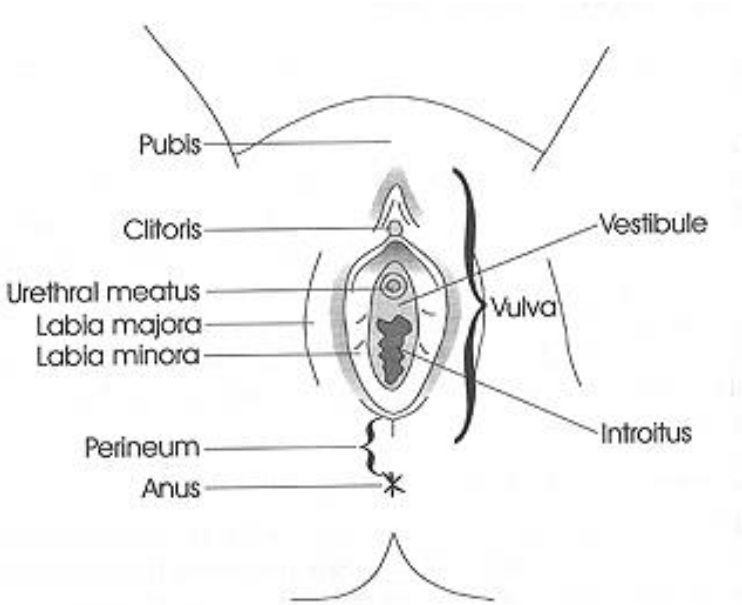
The female pelvis

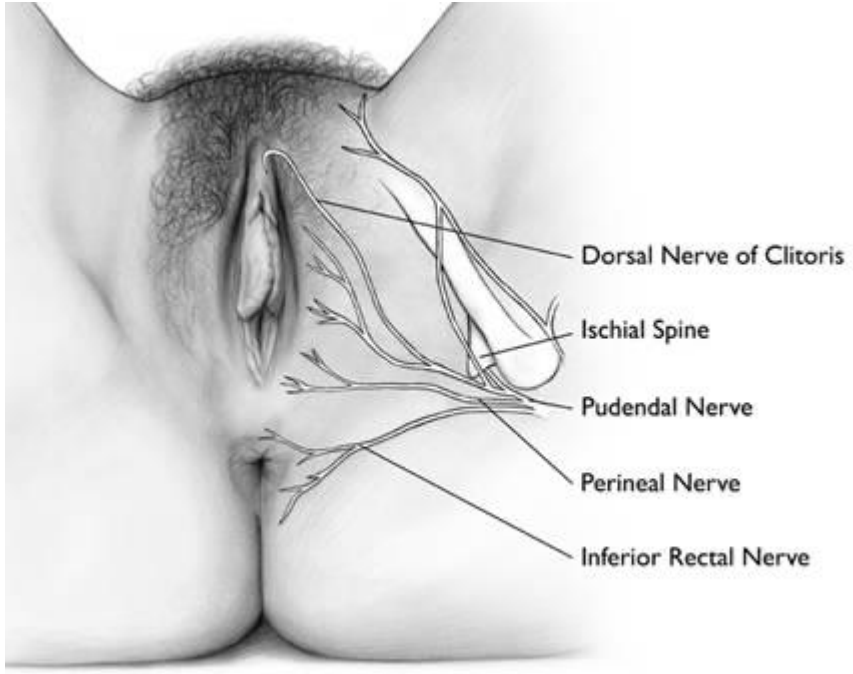
Distal parts of urinary and digestive system: ureter, bladder, urethra, rectum

Internal genitalia: ovaries, uterine tubes, uterus and vagina

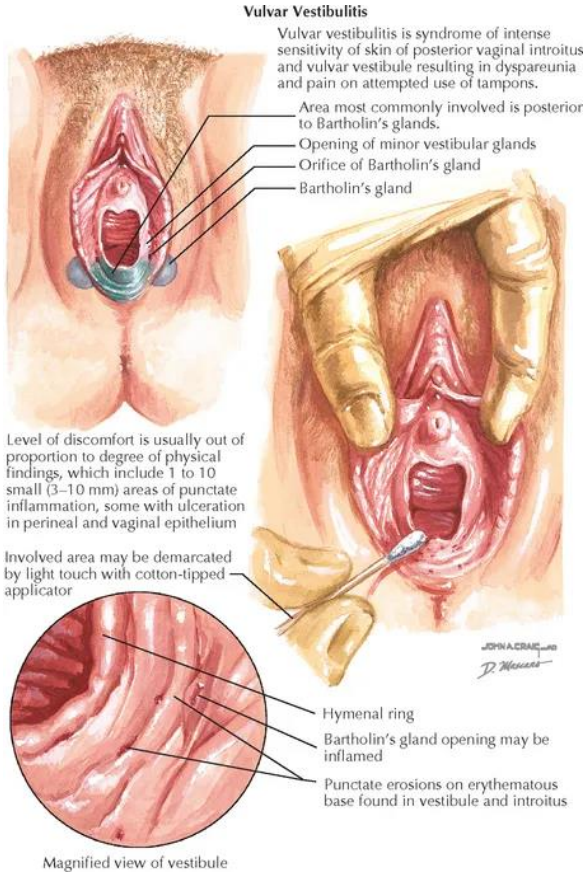
External genitalia: perineum including mons pubis, lbia majora, labia minora, glans of clitoris, vaginal opening

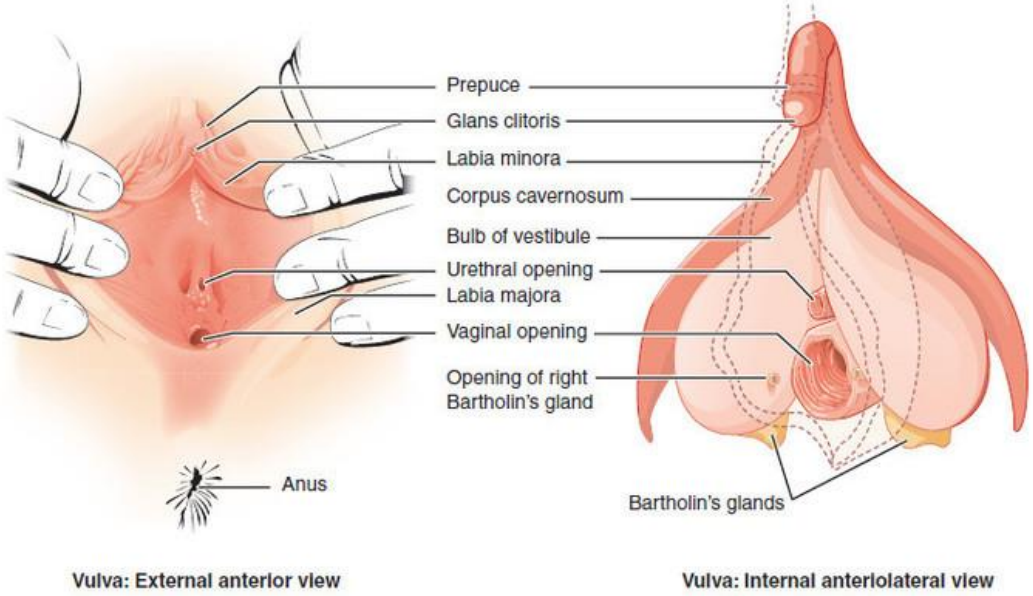
The Vulva


Pubis
Clitoris
Urethral meatus
Labia majora
Labia minora
Perineum
Anus
Vestibule
Vulva
Introitus


Dorsal Nerve of Clitoris
Ischial Spine
Pudendal Nerve
Perineal Nerve
Inferior Rectal Nerve

The Vestibule and Clitoris





Vulva: External anterior view

Vulva: Internal anteriolateral view

Pelvic Pain

Pelvic Pain: Where is it coming from?

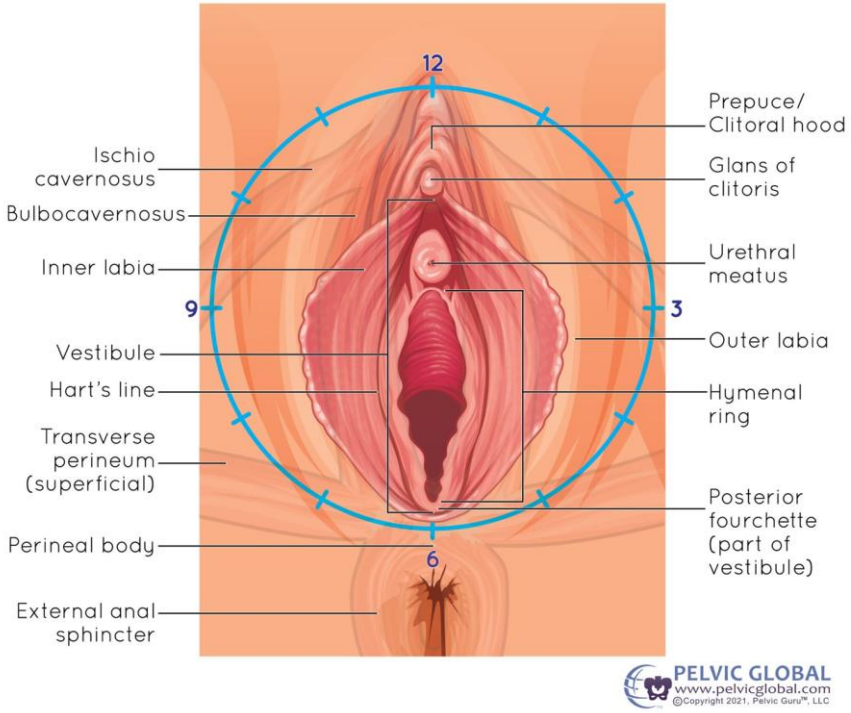
Anatomy can be confusing: It can hurt when you pee because the urine flows over the raw tissue of the vulva.

Bladder pain: Can arise from the bladder and/or from the pelvic floor.

Vaginal pain: Can occur due to inflammation from infection and/or tight pelvic floor muscles.

Vagina, vulva, urethra, clitoris? Location matters.

Location


12
3
6
9
Ischio cavernosus
Bulbocavernosus
Inner labia
Vestibule
Hart's line
Transverse perineum (superficial)
Perineal body
External anal sphincter
Prepuce/ Clitoral hood
Glans of clitoris
Urethral meatus
Outer labia
Hymenal ring
Posterior fourchette (part of vestibule)
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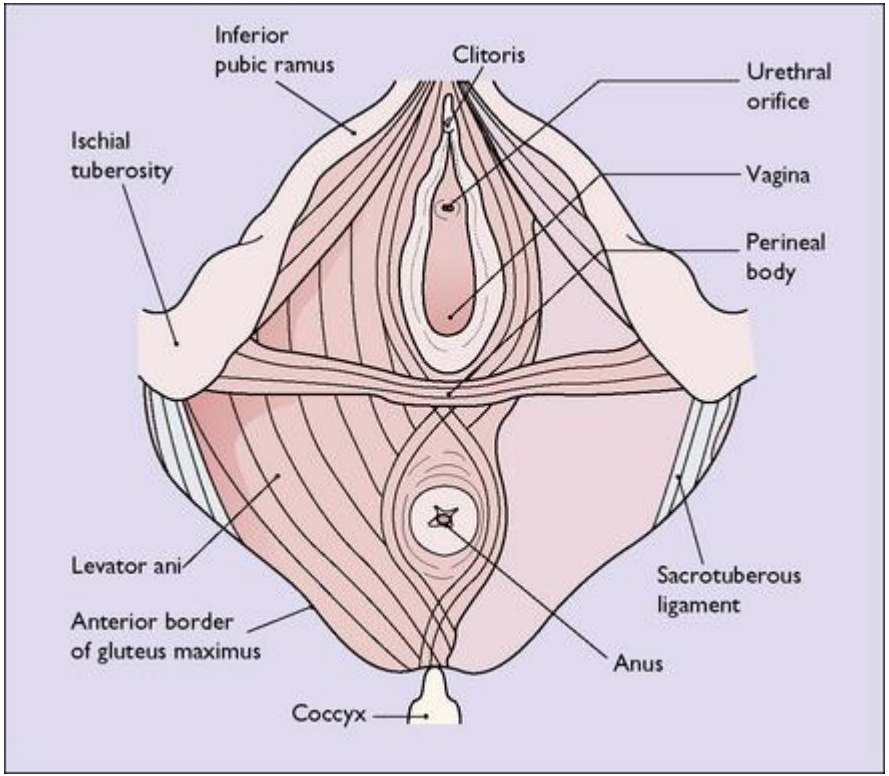
Inferior pubic ramus
Clitoris
Urethral orifice
Ischial tuberosity
Vagina
Perineal body
Levator ani
Sacrotuberous ligament
Anterior border of gluteus maximus
Anus
Coccyx

Vulvar Pain

Vulvodynia: Genitourinary syndrome of menopause, yeast, lichen sclerosus. The differential is wide.

Genitourinary syndrome: low estrogen effect due to hormonal changes, contraceptive use, lactation, cancer treatments

Vestibule pain: lichen planus

Infections: yeast, HSV lesions, bacterial vaginosis

Pelvic Pain

Pelvic Pain: How do you evaluate

1. Clinical exam comes first! If it hurts then you look.
2. Testing with wet mount, swabs as needed, UA
3. Interpret: a low colony count UTI in someone with symptoms should be treated. Some testing options can contribute to over treatment, interpret appropriately and consider this in the context of symptoms and exam.

Get ready to evaluate and treat!

1. Vulvovaginal candidiasis
2. Bacterial vaginosis
3. Trichomoniasis
4. Genitourinary syndrome
5. Lichen sclerosus
6. Lichen planus
7. HSV
8. HPV
9. Chlamydia, gonorrhea, mycoplasma/ureaplasma
10. Pelvic floor dysfunction

Vulvovaginal Candidiasis

Symptoms: itching, dysuria, discharge, dyspareunia, soreness

Evaluation: white discharge and erythematous tissue, positive wet mount, vaginal swab positive

Types: candida albicans, candida glabrata, candida etc.

Treatment: oral and/or topical azole, boric acid

Ex: Fluconzole 150mg, clotrimazole

Vulvovaginal Candidiasis Treatment

Fluconazole: 150mg oral tablet single dose; those with more involvement may require an additional dose after 72hrs

Clotrimazole: 1% 5g once daily 7 days, 2% 5g once daily 3 days

Miconazole: 2% 5g once daily 7 days, 4% 5g once daily 3 days, vaginal suppositories

Nystatin: 1 tablet once daily 7 days

Terconazole: 0.4% 5g once daily 7 days, 0.8% 5g once daily 3 days

Ibrexafungerp: 150mg oral tablet twice a day for 1 day 4 tablets total

Boric acid: 600mg suppository once daily 7 days

Bacterial Vaginosis

Most common cause of discharge

Symptoms: vaginal discharge and odor “fishy smell” often more noticeable after intercourse.

Evaluation: vaginal erythema and thin homogeneous discharge, Nugent criteria, Amsel criteria, Hay/Ison criteria, clue cells on wet mount, NAAT test positive

Treatment: metronidazole

Bacterial Vaginosis Treatment

First Line:

Metronidazole: 500mg orally bid 7 days, 0.75% gel 5g daily 5 days

Clindamycin: 2% cream 5g 7 days

Alternatives:

Clindamycin: 300mg orally bid 7 days, ovule 100mg intravaginally daily 3 days

Tinidazole: 2g orally 2 days, 1g orally 5 days

Secnidazole: 2g packet orally once

Others: Metronidazole 750mg ER daily 7 days, single dose clindamycin 2% bioadhesive cream 5g

Bacterial Vaginosis Partner Treatment

Male and female partners can transmit BV contributing to recurrence.

Recurrence is defined as having 3 or more infections in a 12mth period.

Partner treatment: couple should abstain from sex or use condoms until both partners have completed therapy.

Male partners: dual drug therapy oral metronidazole 500mg bid 7 days and topical 2% clindamycin applied to penile skin twice daily 7 days

Female partners: single antibiotic therapy

Bacterial Vaginosis Treatment

Pregnant or lactating:

oral metronidazole 500mg bid 7 days is preferred as some data indicated oral medication treats upper genital tract infection more effectively.

Planned gynecologic surgery:

individuals undergoing gynecologic procedures should have infections treated to reduce postoperative infectious complications.

Trichomoniasis

Symptoms: purulent, malodorous discharge, dysuria, frequency, dyspareunia, pruritus, burning, lower abdominal pain

Evaluation: vulvovaginal erythema, green-yellow frothy discharge, punctate hemorrhages on vaginal mucosa and/or cervix “strawberry cervix”.

Testing: NAAT, microscopy shows trichomonads (jerky spinning)

Treatment: The 5-nitroimidazole drugs are the only class of drugs that provide curative therapy.

Trichomoniasis Treatment

Metronidazole: 500mg twice daily for 7 days

- Vaginal metronidazole is not recommended, it does not treat all of the anatomy effectively so should not be used to treat trichomoniasis

Single dose options: Metronidazole 2g orally single dose, Tinidazole 2g orally single dose, Secnidazole 2 g orally single dose

Multi dose option: Tinidazole 500mg orally bid 5 days

Herpes Simplex Virus

HSV-1 and HSV-2 can cause genital herpes

Primary: infection without preexisting antibodies. Average incubation period after exposure is 4 days, range 2-12 days.

Symptoms: painful genital ulcers, dysuria, fever, lymphadenopathy

Recurrent: reactivation of genital HSV. Often less severe than primary infection. Duration of lesions is often shorter than in the primary infection.

Diagnosis: clinical diagnosis should be confirmed with laboratory testing, PCR or culture of lesions.

Treatment: Acyclovir, Famciclovir, Valacyclovir

Herpes Simplex Virus Treatment

Episodic therapy: treatment for outbreaks as they arise

- Acyclovir: 800mg 3 tid 2days; 800mg bid 5 days
- Famciclovir: 1000mg bid for 1 day; 125mg bid 5 days
- Valacyclovir: 500mg bid 3 days; 1000mg once daily 5 days

Chronic suppressive therapy: daily antiviral therapy

- Acyclovir: 400mg bid
- Famciclovir: 250mg bid
- Valacyclovir: 500mg once daily or 1000mg once daily

Human Papillomavirus

HPV causes cervical cancer, vulvar and vaginal cancer, genital warts, oropharyngeal cancer and anal cancer

Evaluation: exam shows soft skin colored or grayish white growths that appear as single bumps or cluster resembling cauliflower. Lesions on cervix or found on Pap smear.

Testing: Biopsy and Pap smear with HPV testing

Treatment: Podophyllotoxin, imiquimod, sinecatechins, TCA, LEEP, Cone

Chlamydia/Gonorrhea

Chlamydia trachomatis and Neisseria gonorrhoeae are often tested together as they cause similar symptoms and coinfection is common.

Symptoms: often asymptomatic, urethritis, cervicitis, PID

Testing: NAAT vaginal swab or first catch urine

Treatment: doxycycline, azithromycin, levofloxacin, amoxicillin, ceftriaxone

Chlamydia/Gonorrhea Treatment

Chlamydia preferred regimen: Doxycycline 100mg bid 7 days

Chlamydia alternative regimen: Azithromycin 1g orally single dose, Levofloxacin 500mg orally once daily 7 days, Amoxicillin 500mg orally tid 7 days

Gonorrhea preferred regimen: weight <150kg 500mg IM

weight >150kg 1g IM

Lichen Planus

Erosive lichen planus: most common vulvar lichen planus, desquamative, erosive, chronic changes. 70% with vaginal involvement vs. lichen sclerosus where vaginal involvement is rare.

Presentation: lesions are characterized by well-demarcated, glazed, brightly erythematous patches or erosions with white striae, white border along the margin “wickham striae”. Occur on the labia minora and vestibule isolated or as a part of architectural changes including introital stenosis.

Evaluation: clinical diagnosis and biopsy

Treatment: super high potency topical steroid

Lichen Planus Treatment

Super High Potency Steroid is the treatment of choice and gold standard.

Do NOT be afraid!

Clobetasol: 0.05% ointment finger-tip-unit or 0.5grams daily for 8-12 weeks then reduce to 1-3 times a week for maintenance indefinitely.

Follow up: Follow up in 3-4mths and annually

Lichen Sclerosus

Chronic, progressive, dermatologic condition with distinctive dermal changes, pruritus, pain, inflammation. Primarily found on the vulva.

Hormones: incidence is highest during low estrogen state

Symptoms: vulvar pruritus “it itches right here”, worse at night, perianal pain, anal fissures, dyspareunia, dysuria, hypopigmentation, loss of vulvar architecture,

Diagnosis: Most often clinical diagnosis; white fissures, ecchymoses, anatomical changes. Biopsy is helpful to confirm or when uncertain.

Lichen Sclerosus Treatment

Location of application is important!

Provide a mirror and handout for better understanding.

Clobetasol: apply a finger-tip-unit or 0.5g daily for 12 weeks to induce remission then transition to a maintenance dose twice weekly. In cases of prolonged remission once weekly is a consideration.

Treatment of genitourinary syndrome of menopause (vulvovaginal atrophy) is helpful in reducing symptoms and distinguishing active LS from GSM.

Genitourinary Syndrome

Genitourinary syndrome of menopause previously known as vaginal atrophy is a constellation of symptoms caused by decreased estrogen.

Symptoms include: urinary urgency, frequency, dysuria, recurrent UTI, dryness, burning, irritation, decreased lubrication, pain, decreased arousal, changes to sensation.

Up to 70% of patients with symptoms do not discuss with their provider.

Exam: labia minora resorption or fusion, tissue fissures and fragility, prominence of urethral meatus, urethral eversion, pallor, loss of rugae, decreased lubrication, decreased elasticity

Treatment: Hormones and non hormonal moisturizers

Genitourinary Syndrome Treatment

The best treatment is the one a person will use. Apply to the vulva purposefully.

When it comes to creams throw away the applicator and apply with finger.

Estradiol:

Cream: 1g daily for 2 weeks then 2-3 times weekly

Ring: 1 ring every 90 days

Insert: 10mcg tablet daily for 12 weeks then 2 times weekly

Conjugated equine estrogen: 0.5g daily for 2 weeks then 2 times weekly

Prasterone: 6.5mg vaginal insert daily

Pelvic Floor Dysfunction

Uncoordinated muscles result in symptoms

Symptoms: frequent urination, incontinence, constipation, low back pain, pain in the pelvis, genitalia and rectum

Evaluation: by a clinician or a pelvic floor physical therapist

Treatment: Individualized treatment

Conditions mistaken for PFD: interstitial cystitis, IBS, prolapse

Pelvic Floor Dysfunction Treatment

Pelvic floor physical therapy:

Physician directed or formal pelvic floor physical therapy

How to find a pelvic floor physical therapist.

APTA Pelvic Health PT Locator

Pelvicrehab.com practitioner directory

Resources

1. The Menopause Society
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3. Coslov N, Richardson MK, Fugate Woods N. Menopause 2024 Mar 25
4. Crandall CJ, JAMA, 2023, Feb 7
5. Santoro N, et al. J Clin Endocrinol Metab 2021;106:1-15
6. Bastian et al. JAMA 2003;289:895-902
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8. Workowski KA, Bachmann LH, Chan PA, et al. STI Treatment Guidelines 2021. MMWR Recomm Rep 2021; 70:1
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