BACTERURIA

Findings

- **Positive Assessment Findings**
  - Dysuria
  - Urinary frequency
  - Urinary urgency
  - Urinary incontinence
  - Nocturia
  - Hematuria
  - Bladder distention or tenderness
  - Cloudy, foul-smelling urine
  - Vaginal discharge or discomfort
  - Irregular menses or painful intercourse
  - Upper abdominal pain or adnexal tenderness, cervical motion tenderness, and guarding on bimanual examination
  - Inflamed or swollen Skene, Bartholin glands
  - Urethral discharge, penile lesions
  - Fever, chills
  - Low back or suprapubic or costovertebral angle (CVA) pain/tenderness
  - Mental status changes/confusion, malaise, lethargy without another explanation
- **Negative Assessment Findings**
  - Absence of dysuria, frequency, urgency, fever, low back of CVA pain/tenderness

Risks and History Taking

- **Female gender**
  - Pregnancy, history of pregnancy
  - Sexually active or postmenopausal
  - Disrupted vaginal flora
  - Post-invasive procedures
  - Use of spermicides, diaphragms during intercourse
  - Douching
- **Male gender**
  - Urinary catheter / history of GU procedure; diagnostic or surgical
  - Anatomical abnormalities of GU tract
  - Unprotected anal intercourse, regardless of sexual orientation
  - Vaginal intercourse with a woman with a bacterial infection
  - Prostate issues
    - Inadequate treatment of prostatitis
    - Enlarged prostate
  - Over age 50 – UTI; Over age 35 - epididymitis
  - Lack of circumcision if unable to self-care (i.e., dementia)
  - Sexually transmitted infection present
  - Epididymitis (risk for UTI)
  - Orchitis
- **Age**
  - Young women
  - Sexually active young adults
  - Very young children
  - Frail older adults
- **Anatomy**
  - Anatomically short urethra (women)
  - Urologic abnormalities promoting reflux
  - Cystocele
  - Rectocele
- **Health Condition**
  - Prior history of UTI (within 2 weeks of the original UTI) or of prostatitis
  - Distal urinary or urethral obstruction; voiding difficulties and/or renal stones (esp. struvite)
  - Instrumentation, catheterization, diagnostics, and surgeries of GU tract
  - Catheter dependency
  - Neurogenic bladder
    - Spinal cord injury
    - Stroke
    - Neurologic disorders impeding the sensation to void
  - Chronic illnesses, particularly affecting sensory function
    - Immunosuppression or medical compromise
    - Diabetes
    - Multiple sclerosis
    - Amyotrophic lateral sclerosis (ALS)
    - Kidney disease
      - Pyelonephritis or history of
  - Alkaline urine (>7 pH)
  - Acute infections elsewhere in the body
  - Interstitial cystitis
- **Activities & Lifestyle**
  - Trauma to the testes
  - A new sexual partner, multiple sex partners, or high-risk behaviors
  - Sexual contact with a symptomatic partner
  - Current or prior history of an STI
  - Inadequate fluid intake, or infrequent emptying of bladder
  - Poor/nonsterile catheterization technique
  - Disposable or indwelling catheters
  - Poor hygiene / fecal contamination
  - Unprotected anal or sexual/vaginal intercourse

Differential # 1: Lower Urinary Tract Infection (UTI)

(Cystitis / urethritis; if *positive* assessment findings…)

- **Diagnostics**
  - Midstream clean-catch (MSCC) urine sample showing the presence of bacteria greater than $>10^3$ organisms in 2 consecutive cultures in the presence of characteristic clinical symptoms (acute uncomplicated in women) or $>10^4$ CFU/m in 2 consecutive cultures (acute uncomplicated pyelonephritis)
  - Straight catheterization urine samples obtained with sterile technique are the *most* reliable
  - Urinalysis with microscopy provides rapid results but urine should be examined first, not necessarily cultured

Differential # 2: Epididymitis (infectious)

- **Diagnostics**
  - Positive assessment in addition to
    - Positive Prehn's sign, swelling, and/or pain of the scrotum
  - Urinalysis – WBCs and leukocytes
  - Gram stain of urethral discharge
  - Culture if history consistent with STI
    - Presence of WBC *without* bacteria indicates Chlamydia as likely pathogen
  - CBC
    - Elevated WBC with left shift

Differential # 3: Pelvic Inflammatory Disease (PID)

- **Diagnostics**
  - Pelvic examination with culture, gram-staining, DNA testing
  - CBC with elevated WBC and ESR
  - Pregnancy test
  - HIV and syphilis infection testing
- **Management**
  - **Pharmacologic Rx – broad-spectrum anti-infectives**

- If pyuria (greater than 10 neutrophils per HPF on microscopic exam), or leukocyte esterase, nitrites, and RBC on dipstick, treat uncomplicated UTI
- Pregnancy test for women of reproductive potential
- Culture and sensitivity if complicated infection suspect; $>10^5$ CFU/ml for women, $>10^4$ in men or catheterized women; culture is gold standard
  - If complicated, consider renal ultrasound & referral

- **Management**
  - **Pharmacologic Rx** varies; Acute uncomplicated UTI (all PO)
    - TMP-SMX (Bactim/Septra DS) BID x 3 days
    - Ciprofloxacin, Levofloxacin, Norfloxacin, and Ofloxacin; Ciprofloxacin 250mg BID x 3 days
    - Amoxicillin or Augmentin; 500mg BID *or* 250mg TID x 10 days
    - Cefaclor or Cefuroxime 250mg BID x 7-10 days
    - Cefixime or Cefpodoxime 400mg daily x 3-7 days
  - **UTI that recurs frequently** may require prophylactic antibiotic
    - Nitrofurantoin 100mg BID x 5-7 days
  - **Complicated UTI Rx**
    - Bactrim DS IV (refer)
    - Ciprofloxacin 500mg PO BID x 7-14 days
    - Amoxicillin 875mg BID *or* 500mg TID x 10 days
  - **Analgesic**
    - Phenazopyridine (Pyridium) 200mg TID after meals, max 2 days
  - **Antispasmodic**
    - Flavoxate (Urispas) 100-200mg 3-4 times per day.
  - **Herbal supplements & other**
    - Cranberry (limited efficacy according to literature)
    - Probiotics

- **Patient Education**
  - Increase fluid intake to at least eight 8-oz glasses of water daily
  - Empty bladder frequently at first sensation, and completely
  - Complete full course of antibiotic therapy & take with full glass of water
  - Wear cotton underclothes; avoid thong style and nylon
  - Take showers instead of tub or bubble baths
  - Keep diary of urinary symptoms
  - Avoid use of harsh soaps, feminine hygiene products
  - Use condoms during sexual intercourse and avoid spermicides
  - Urinate before and after sexual intercourse
  - Proper technique for self-catheterization
  - Some antibiotics reduce effectiveness of oral contraception
  - Pyridium stains clothes, urine orange

- **Follow-up**
  - MSCC urine sample to evaluate for WBC, or C&S for all *recurrent* infections
  - **Indications for additional evaluation**:
    - Indwelling catheters (should be changed every 4-6 weeks)
    - Urinary tract obstructions must be identified to prevent chronic infection, renal damage

- Ultrasound of scrotum

- **Management**
  - **Pharmacologic Rx**
    - **Anti-infectives**
      - In men younger than 35 years of age with sexually transmitted epididymitis:
        - Ceftriaxone 250 mg IM once, plus doxycycline 100 mg PO twice a day for 10 days
        - If allergic to cephalosporins or tetracyclines, a fluoroquinolone can be substituted (ofloxacin 300 mg PO twice a day for 10 days, or levofloxacin 500 mg PO daily for 10 days)
      - In men with nonsexually transmitted forms:
        - Ciprofloxacin 750mg PO BID, or
        - Ofloxacin 200 – 300 mg PO BID, or
        - TMP-SMX one DS tablet PO BID for 2-3 weeks
      - Septic or hospitalized men:
        - Ceftriaxone 1 – 2 grams IV or IM every 24 hours
        - Aminoglycoside 1mg/kg IV or IM every 8 hours is alternative
    - **Analgesic**
      - Tylenol with opioid combination
      - In severe cases, spermatic cord block with local anesthetic
  - **Non-pharmacologic**
    - Bedrest with scrotal elevation
    - Ice / cold packs
    - Surgical treatment may be necessary, depending on severity (refer for aspiration, vasostomy, exploratory surgery, drainage of abscess, epididymectomy, orchiectomy)

- **Patient Education**
  - Limit activity
  - Immobilize scrotal contents for pain relief
  - Need to wear athletic supporter
  - Avoid sexual contact and physical activity as long as pain persists
  - Complete full course of antibiotics

- **Follow-up**
  - Monitor patient condition until no signs of infection
  - **Re-evaluate** for/if
    - Persist paint lasting longer than 3 days
    - Recurrent epididymitis
    - Abscess formation

    - Ceftriaxone 250mg IM in a single dose, *or* Cefoxitin 2g IM + probenecid 1g PO, *or* another third-generation cephalosporin, ***plus***
      - Doxycycline 100mg PO BID x 14 days
      - With or without:
        - Metronidazole 500 mg PO BID x 14 days
  - **Non-pharmacologic**
    - Rest
    - Increase non-caffeinated fluid intake
    - Avoid sexual contact until Rx completed

- **Patient Education**
  - Prevention of STIs – abstinence, monogamous partners, and/or condom use
  - Treat **both** partners
  - Complete all antibiotics
  - Discontinue douching practices

- **Follow-up**
  - Clinical symptoms should improve within 72 hours; if not, further evaluation required
    - Need for additional anti-infective therapy, parenteral antimicrobials, and/or hospitalization
  - May require testing to rule out tubo-ovarian abscess, UTI, nephrolithiasis, IBD, ectopic pregnancy
  - Repeat testing for Chlamydia or Gonorrhea 3-6 months post-treatment
  - **Additional evaluation/hospitalization** *if*
    - Inability to follow or tolerate PO regimen
    - No clinical response to PO antibiotics
    - Pregnancy
    - Concurrent severe illness, nausea/vomiting, or high fever
    - Surgical emergency (appendicitis, ectopic pregnancy) cannot be excluded
    - Tubo-ovarian abscess is diagnosed

References

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