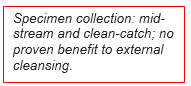
**11. Dysuria/UTI by Danielle Brooks**

**Overview:**

**Urinalysis:** essential to diagnose conditions such as calculi, urinary tract infection, and even malignancy.

* **Dipstick urinalysis:**
  + Specific gravity: correlates with urine osmolality and concentrating ability of kidneys.
    - Normal: 1.003-1.030
    - <1.010 = relative hydration
    - >1.020 = relative dehydration
  + pH: normal pH 5.5-6.5. Often correlates with serum pH.
    - Useful in UTI, for example: alkaline urine indicates urea-splitting organism
  + Hematuria: 3+ RBCs per high-powered field in 2/3 urine samples.
    - Dipstick test detects RBC’s peroxidase activity, so a positive test can also mean myoglobinuria or hemoglobinuria.
    - 20% of patients with gross hematuria have urinary tract malignancy🡪 require further work up with cystoscopy and abdominal imaging.
  + Proteinuria: urine protein excretion >150 mg/day (microalbuminuria is 30-150 mg/day).
    - U-dip is typically sensitive to albumin and will be positive at concentrations 5-10 mg/dL.
    - 1+ is about 30 mg/dL; 2+ is about 100 mg/dL; 3+ is about 300 mg/dL; 4+ is about 1,000 mg/dL.
  + Glycosuria: will be positive if glucose is present at 180-200 mg/dL.
  + Ketonuria: Uncontrolled diabetes, pregnancy, carb-free diets, starvation
  + Nitrites: Present when certain gram-negative and gram-positive bacteria reduce nitrates.
    - Bacteria load is >10,000/mL if positive.
    - Highly specific but not sensitive so a negative result does **not** rule out UTI!
  + Leukocyte esterase: Produced by neutrophils. Suggests pyuria.
* **Microscopic urinalysis:** used to detect cells, casts, crystals, and bacteria.
  + Cells**:** squamous epithelial cells suggest contamination; transitional epithelial cells are normal; renal tubule cells suggest kidney pathology.
  + Casts: can help localize disease to specific part of GU tract
  + Crystals: calcium oxalate, uric acid, triple phosphate (often seen in alkaline urine, UTI), cysteine
  + Bacteria: 5 bacteria per HPF equates to about 100,000 CFU/mL

**Urinary Tract Infections: Outpatient Management**

* The most common form of UTI is **acute uncomplicated cystitis**:
  + Symptoms: dysuria, urinary frequency or urgency in healthy, non-pregnant female patients
  + Physical exam: usually normal, but may see suprapubic tenderness in 10-20%.
  + Diagnosis: defined as symptoms above + positive urine culture (> 103 CFU/mL of bacteria).
    - Note, however, that empiric treatment *without* urine culture results is the mainstay of management in the outpatient setting.

|  |  |
| --- | --- |
| **Regimens in Acute Uncomplicated Cystitis:** | **Dosing:** |
| *First Line Therapy:* |  |
| * Trimethoprim-Sulfamethoxazole | 160/800 mg BID x 3 days  (Avoid if resistance prevalence >20% or if used to treat UTI in last 3 months) |
| * Nitrofurantoin | 100 mg BID x 5 days |
| * Fosfomycin | 3 g single dose |
| *Other options:* |  |
| * Fluoroquinolones | Increasing *E. coli* resistance may hinder empiric use. Usually reserved for more invasive infections and non-GU disease.   * Ciprofloxacin 250 mg BID x 3 days * Ciprofloxacin, extended release 500 mg daily x 3 days * Levofloxacin 250 mg daily x 3 days * Oflaxacin 200 mg daily x 3 days or 400-mg single dose |
| * β-lactams | Increasing *E. coli* resistance.   * Amoxicillin-clavulanate 500/125 mg BID x 7 days * Cefdinir 300 mg BID x 10 days * Cefpodoxime 100 mg BID x 7 days |

**At IMA:**

* Order: urine-dip and urinalysis for patients with urinary symptoms
  + If there are WBCs, +nitrite, +leuk esterase🡪 treat empirically
  + +Nitrite is more useful than +leuk esterase
  + If both nitrite and leuk esterase are negative, the chance of UTI is reduced by 40-60%
* Order urine culture if history of recurrent UTIs or if no improvement with empiric treatment
* Patient-initiated therapy: women with history of UTI are given a prescription with instructions to initiate treatment at symptom onset

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