

# UTI Study Cheat Sheet

## Bacteriuria Definition

In women = 2 consecutive voided urine samples with the same bacteria at a quantity  $\geq 10^5$  CFU/mL

In men = a single, clean catch voided urine sample with 1 bacteria at a quantity  $\geq 10^5$  CFU/mL

In catheterized patients = a catheterized urine sample with 1 bacteria at a quantity  $\geq 10^2$  CFU/mL

- Pyuria (WBCs in urine) + ASB is **not** an indication for antibiotic treatment
- ASB rarely requires treatment, but exceptions can be: pregnancy, recent transplant, upcoming urological procedure that includes mucosal bleeding

- Possible UTI s/sx: dysuria, frequency, urgency, abdominal pain. With systemic symptoms of fever, flank pain or costovertebral angle (CVA) tenderness, beware pyelonephritis (aka kidney infection aka upper UTI)
- Cloudy, foul smelling urine alone is a poor indicator of UTI, more is needed to make a UTI diagnosis
- After *Escherichia coli*, the second leading cause of UTI is *Staphylococcus saprophyticus*
- Beware yeast or Enterococci in the urine may be contaminant given proximity of the GU tract to the GI tract

## Comparison of Select Oral UTI Drugs\*

	<u>Sulfamethoxazole/trimethoprim</u>	<u>Nitrofurantoin</u>	<u>Ciprofloxacin</u>	<u>Amoxicillin/clavulanic acid</u>	<u>Fosfomycin</u>
Brand name:	Bactrim, Septra	Macrobid, Macrochantin	Cipro, Cipro XR	Augmentin	Monurol
Mechanism:	Folate synthesis inhibitor	Inhibit bacterial protein synthesis	Inhibit DNA gyrase + topoisomerase	Binds to penicillin binding proteins, inhibiting cell wall synthesis	Inhibits pyruvyl transferase, inhibiting cell wall synthesis
Typical adult dose for UTI:	1 DS tablet BID	100mg BID (Macrobid) 50-100mg Q6H (Macrochantin)	250-500mg BID (cipro) 500-1000mg Q24H (Cipro XR)	500-875mg BID	3gm PO x1
Renal adjust:	CrCl < 30	Avoid CrCl < 30	CrCl < 50	CrCl < 30	No
Approx. E. coli resistance rate:	25-35%	5-10%	25-35%	High	5%
OK for upper UTI:	Yes	No	Yes	Yes**	No
Side effects:	Rash, hyper-K+	Pulmonary toxicity (repeated or long-term use)	Many. See below + QT prolongation, photosensitivity	Diarrhea, hypersensitivity	Well tolerated
Notes	Beware sulfa allergy	A good empiric drug	FDA says avoid for uncomplicated cystitis	Reserve use for known sensitivity	Expensive, reserve for MDR

\*Oral cephalosporins not included due to lack of space; \*\*Typically beta-lactams require a longer duration of therapy

### Methenamine (Hiprex)

- ✓ Prophylaxis only
- ✓ Need urine pH  $\leq 5.5$
- ✓ Converts to formaldehyde
- ✓ No resistance concern
- ✓ Not for chronic cath patients
- ✓ Avoid w/ sulfas or gout

### When to Avoid Nitrofurantoin

- ✓ Known resistant organism
- ✓ CrCl < 30 or very elderly
- ✓ Concern for prostatitis
- ✓ Upper UTI or systemic infection
- ✓ For long-term/ repeated courses

### Fluoroquinolone Boxed Warnings

1. CNS effects
2. Tendonitis
3. Tendon rupture
4. Peripheral neuropathy
5. Worsen existing myasthenia gravis

- 1<sup>st</sup> questions when you see a positive urine cx: (1) how was it taken?, (2) is it a contaminant or colonizer?
- Most chronically catheterized patients will have a positive urine culture, but do not need abx
- Generally avoid for UTI: moxifloxacin, tigecycline, micafungin, polymyxin B
- Fluoroquinolones remain a go-to drug class for prostatitis (usually ciprofloxacin or levofloxacin)
- In a male UTI is considered “complicated”, but nitrofurantoin may still be an option for lower UTI in a male
- Beware interactions with any UTI drugs and warfarin
- On the inpatient setting, ceftriaxone is a common injectable drug used for UTI

Abbreviations: ABX = antibiotics, ASB = asymptomatic bacteriuria, cx = culture, MDR = multidrug resistant, s/sx = signs and symptoms, SMX/TMP = sulfamethoxazole/ trimethoprim, UTI = urinary tract infection