Treatment of UTI BY Antibiotics

Drug	MOA	Pharmacokinetics		Adverse Effect	Contraindication
Co-trimoxazole Sulfamethoxazole (SMX) & Trimethoprim (TMP)	Alone, each agent is **bacteriostatic** Together they are **bactericidals** (synergism) ✓ See the figure Below	Sulfonamides : **orally** absorbed →stomach & small intestine. Widely distributed in all tissues → (CNS, CSF), placenta and fetus. 70% bind to serum protein Metabolized →liver by: acetylation. Eliminated →**urine**	TMP: **orally** absorbed →gut Widely distributed → (CSF) More lipid soluble than SMX 40% Protein bound 60% of TMP or its metabolite is excreted →urine. TMPcomcentration is more in **prostatic fluid.**	1. Nausea, Vomiting, Allergy 2. Hematologic A)**Acute hemolytic anemia** in: a) hypersensitivity b) G6PD deficiency B)**Megaloblasticanemia in TMP** 3. Drug interactions Displace bilirubin- →kernicterus warfarin, oral hypoglycemics.	1. **Pregnancy** 2. Nursing mother 3. Infants under 6 weeks 4. Renal or hepatic failure 5. Blood disorders
Nitrofurantoin	Effective against **E. coli**, but other common UT gm- bacteria may be resistant. **Gm+** cocci are susceptible.	Sensitive bacteria reduce the drug to an active agent that inhibits various enzymes and **damages DNA**.	100% Absorption→**oral** Metabolized & excreted rapidly → **no systemic action** Excreted→ glomerular filtration & tubular secretion. **Brown** urine.	GI disturbances: nausea, vomiting and diarrhea. Headache and **nystagmus**. **Used :** lower UTI's.	Patients with G6PD deficiency(haemolytic anaemia) Neonates **Pregnant women**
Tetracycline **Doxycycline**	Inhibit **protein synthesis** by binding reversibly to 30 s subunit	Orally →90-100% absorbed Absorbed in the upper s. intestine & best in **absence of food** Food & di & tri-valent cations (Ca, Mg, Fe, AL) **impair absorption** Protein binding 40-80 % Distributed well, including CSF Cross placenta and excreted in milk Largely metabolized in the liver	**Adverse Effect:** 1. nausea, vomiting and diarrhea 2. Thrombophlebitis – i.v 3. Hepatic toxicity (prolonged therapy with high dose) 4. **Brown discolouration of teeth** – children 5. **Deformity or growth inhibition of bones** – children 6. Vertigo 7. Superinfections.		**Uses:** Treatment of UTI's due to **Mycoplasma** & **Chlamydia**, 100 mg po bid for 7 days.
Ceftriaxone & **Ceftazidime**	Inhibition of **cell wall** synthesis→ **Bactericidal**	They are given **parenterally**	3rd generation cephalosporins(β-lactam)	Mainly effective Against gm- bacteria.	
PROSTATITIS	**a) Acute prostatitis:** 1. **Non- catheter-** gm- (**E.coli** or **Klebsiella**), **Antibiotics used:** TMP/SMX,IV(160/800mg bid), **cephalosporin** or **ciprofloxacin**. 2. **Catheter associated** due to gm- or enterococci. **Antibiotics used: ciprofloxacin** or **ceftriaxone**.		**b) Chronic prostatitis:** **E.coli**, **Klebsiella** & **Proteus. Antibiotics used: ciprofloxacin**,500mg bid for at least 12 wks