

Big Bugs since β -Lactam Lectures

Bugs	Characteristics	Disease	Common Rx
Toxoplasma gondii	Protozoa (in cat feces)	Toxoplasmosis	Pyrimethamine/sulfa drugs (This is similar in action to TMP/SMZ)
Anaerobes: Above diaphragm Anaerobic strep (Gm+) and Prevotella (Gm -)	Mouth bacteria	Lung abscess or Aspiration pneumonia	Metronidazole (MTZ) Clindamycin, Amp/sulbactam or Pip/tazo (good for mixed inf.)
Anaerobes: Below diaphragm B. fragilis	Gram (-)	Intrabdominal abscess	Metronidazole, Clindamycin
H. pylori	Gram (-)	Ulcers	Tetracycline, MTZ, clarithro
Enterococcus faecalis	Gm +	Nosocomial	Ampicillin, vanco
Enterococcus faecium	Gm +	Nosocomial	Synercid, Linazolid, Dapto
Stenotrophomonas maltophilia	Gm - (Pseudomonas-like)	Nosocomial	TMP-SMZ, minocycline
Borellia Burgdorferi	Spirochete	Lyme Disease	Tetracycline (TC)
Rickettsia rickettsiae	Parasite, intracellular Tiny bacteria	Rocky Mtn Spotted Fever	TC
Chlamydia trachomatis (CT)	Intracellular bacterium	Cervicitis, urethritis, PID	(Azithro stat); TC (7d); Fluoroquinolone (7d)
Chlamydia pneumoniae (CP)	Intracellular bacterium	A mild pneumonia	(Macrolides), TC, Levo, moxi
Giardia lamblia	Protozoa in water	Giardiasis	MTZ
Trichomonas vaginalis (Tric)	Protozoa	Tric (STD)	MTZ

Pneumocystis carinii	Actually is a fungus	PCP pneumonia in AIDS patients	TMP-SMX
Clostridium difficile	Gram pos anaerobe (spores)	Diarrhea, pseudomembranous colitis	MTZ (first choice), Vancomycin PO (if fail MTZ), probiotic (Saccharomyces boulardii)
Mycoplasma pneumoniae	Tiny, cell wall-less bacteria	A mild but prolonged pneumonia (walking pneumonia)	Tetracyclines Macrolides, fluoroquinolones

Big Drugs since β -Lactam Lectures

Class	Drug	Big Use	MOA	Toxicities	Other
Sulfa Drugs	Sulfamethoxazole TMP-SMX	UTI UTI, others (eg toxo, prostatitis, CA- MRSA)	PABA antagonist PABA antagonist + DHFR inhibitor	Rash, Allergy	Not for < 2 months 'static drugs
	Dapsone	Leprosy, PCP	PABA antagonist	kernicterus (infants)	
Metronidazole (MTZ)	MTZ	Protozoa Anaerobes C. difficile	Forms reactive metabolite/suicide substrate	"Antibuse" effect Bad taste	P450 2C9 inhibitor: interacts with warfarin 'cidal drug
Clindamycin	Clinda	Anaerobes Some Gm(+) aerobes	Binds 50S, inhibit protein synthesis	Diarrhoea C. difficile risk	'static drug
Glycopeptide	Vancomycin	Gram (+) res to other Rx, C. dif, MRSA, PRSP, Enterococcus faecalis	Inhibit cell wall synthesis	Red man syndrom Nephrotox: (contribution of vanco or Aminoglycoside?)	Not absorbed orally 'cidal drug
Tetracyclines	TC QID doxy BID Tigacycline=IV only	Chlamydia RMSF, Lyme disease H. pylori Acne M. Pneumoniae	Binds 30S, inhibit protein synthesis	GI upset, diarrhoea Overgrowth eg: Candida Teeth staining Bone weakening	Not for kids < 8 yo Not for pregnancy / lactation 'static drug

Aminoglycosides (AG)	Genta Tobra Amikacin	Gram (-) Nosocomial infections Gram (+) when used with cell wall inhibitors	Binds 30S, inhibit protein synthesis Bacteriacidal	Nephrotox Ototox	Not orally absorbed
Fluoroquinolones (FQ)	Cipro bid Levo qd Moxi qd	Cipro Gram (-) > Gram (+) Levo Gram (-) = Gram (+) Moxi Excellent Gram (+) > Gram (-)	Topoisomerase inhibitors (DNA gyrase) Moxi inhibits both topo II and IV	Rel. Safe, may affect cartilage formation, rare tendon rupture	PO, IV P450 1A2 inhibitor (cipro) Not for < 18 yo
Macrolides	Erythromycin Clarithromycin Azithromycin	Not Enterobacteriaceae Erythro is mostly Gram + Clarithro and Azithro are more broad spectrum	Bind 50S to inhibit protein synthesis	Erythro is irritating to GI tract	Erythro is CYP3A4 and p-glycoprotein inhibitor. Also clarithro; all have excellent tissue but not CNS penetration
Cyclic peptide class	Dalfopristin/quinupristin (Synercid)	E. faecium, MRSA	Separate sites on 50S	Some arthralgias	CYP3A4 inhibitor Expensive IV only
oxazolidinones	Linazolid	Gram positive resistant pathogens	Binds to 50S to prevent initiation complex	Rare thrombocytopenia	MAO inhibitor PO and IV drug expensive
Cyclic lipopeptide	Daptomycin	Gram pos resistant pathogens	Binds to cytoplasmic membrane, 'cidal drug	Rare myopathy	IV drug expensive

Drug Interactions

1. P450 related:

P450	Inhibitors	Inducer	Common interactions
1A2	Cipro		Caffeine, theophylline
2C9	MTZ		Phenytoin, warfarin
3A4	Synercid		Many drugs

3A4, 2C9		rifampin	Many drugs
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2. Divalent cations (decrease absorption)
Fluoroquinolones
Tetracyclines

Special Problems

Community cough

Strep pneumo
H. flu
M. cat
Mycoplasma pneumoniae
Chlamydia pneumoniae

-Use: Macrolides, doxy, levo, moxi

Pregnancy

NO sulfas
NO TC
NO clarithro
NO FQ
MTZ - controversial (but probably OK for short term Rx)

Kids

FQ not < 18 yo (normally)
TC not < 8 yo
Sulfa not < 2 months

Updated 4/29/08