Drug	Spectrum	MOA	Pharmacokinetics	ADRs
1-Penicillins **Note: first 3 drugs (3 rows) are *Inhibitors of cell wall synthesis* (*β-Lactam Antibiotics*** ***Extended Spectrum Penicillins*:** **Amoxicillin,Ampicillin** **-Active against gram positive & gram negative microorganism.** ***Narrow Spectrum Penicillin*** ***Penicillin G*:** -Narrow spectrum -Destroyed by gastric acidity (so it is given parentally) -Inactivated by β- lactamase -Short acting (4-6 hrs)	-Irreversibly inhibits **transpeptidase enzyme** that catalyze the final step in cell wall synthesis of bacteria**.(Inhibits the synthesis of peptidoglycan layer of bacterial cell wall)**	**-Inactivated by β- lactamase enzyme, (So given with B-lactamaseinhibitors are available e.*g Amoxicillin + Clavulanic acid and ampicillin + salbactum*.** **-Amoxicillin and ampicillin are Acid stable(effective orally)** **-Can be given parenterally (I.V orI.M)** **-Amoxicillin is better absorbed from the gut & not affected by food.**	**-Hypersensitivity** **-Diarrhea** **-Nephritis** **-Neurotoxicity**
*2-**Cephalosporins*** **3rd generation** Ceftazidime **Ceftriaxone**	**-Highly effective against Gm –ve bacilli** **-Anaerobic microbes** **-Pseudomonas** **-Highly resistant to β- lactamase compared to penicillin** **-Effective in Gm-ve meningitis**	**-Inhibits bacterial cell wall synthesis**	**-Both of them are given by intravenous infusion**	**-Allergy** **-Thrombophlebitis** **-Renal toxicity** **-Superinfections**
*3-**Carbapenems*** **Imipenem**	-Has a wide spectrum of activity -Resistant to **most β lactamases** except **metallo-β lactamase .**	**-Bctericidal, inhibit bacterial cell wall synthesis.**	**-Not absorbed orally,taken by I.V.** **-Inactivated by dehydropeptidases in renal tubules, so it is given with an inhibitor cilastatin for clinical use.** **-Penetrates body tissues and fluids including C.S.F.**	**-Nausea,vomiting,diarrhea** **-Skin rash and reaction at the site of infusion** **-High doses in patients with renal failure may lead to seizures** **-Patients allergic to penicillins may be allergic to carbapenems .**

4-Vancomycin -May be combined with ampicillin or ceftazidime as an initial therapy of meningitis in infant, elderly and immunocompromised patients .	-Active only against Gm+ve bacteria -Used in combination with 3rd generation cephalosporins for treatment of meningitis caused by penicillin resistant pneumococci. -Good drugs used against(MRSA).	-Cell wall inhibitor	-Poorly absorbed orally -Given intravenously -Used orally to treat GIT infections caused by clostridium defficile e.g colitis.	-Phlebitis -Ototoxicity -Nephrotoxicity -Histamine release [red man (red neck)] -Hypotension
Fluoroquinolones *Ciprofloxacin* *Contraindicated in :* ▸ *Growing children (below 18 years)* ▸ *Pregnancy* ▸ *Lactation* ▸ *History of epilepsy or CNS disorder*	-Effective against :Gm-ve organisms -Limited activity :against Gm+ve organisms -Effective in patients who are allergic to penicillins. -Effective against :intracellular pathogens such as: Legionella, Chlamydia, some mycobacteriae	Block bacterial DNA synthesis by inhibiting bacterial topoisomerase 11(DNA gyrase) & topoisomerase1V	-Well absorbed orally -Absorption is impaired by divalent cations ; iron, zinc or those in antacids as aluminium, magnesium) -Half-life 3hrs -Widely distributed in body fluids & tissues -Penetrates into CSF -Highly concentrated in bone, kidney, prostate, lung -Excreted through kidney & appear in breast milk	-GIT upset -CNS :Headache , dizziness, insomnia -Abnormal liver function tests -Skin rash & photosensetivity -Cartilage damage (arthropathy) -Tendon damage (tendinitis) -Enzyme inhibitor