Antibiotics

1- B –Lactam groups: These are antibiotics whom have B-lactum ring in their structure made it bacteriocidal activity by preventing the enzyme synthesis of bacterial cell wall . It includes Penicillins, cephalosporines , monobactams like aztreonam and carbapenemes .

These antibiotics are G. +ve bactericidal , most of G. -ve bacteria and G. +ve unaerobic bacteria .

Its side effect 0.7-10% allergy with 0.004-0.015 anaphylactic reaction with cross reaction to cephalosporin in 30% especially to 1st generation and less to 2nd generation and rare to 3rd generation cephalosporine so skin test of drug allergy is better to be done and better to avoid all B-lactum antibiotics. Other side effect intersteitial nephritis where it potentiated by aminoglycosides antibiotics , gastrointestinal symptoms like nausea, vomiting and diarrhea .other side effects are rare like encephalopathy and seizure, leucopenia and thrombocytopenia the drugs are safe in pregnancy except imipenem and cilastatin

a- Penicillins :Natural penicillin like benzyl penicillin (1.2 -2.4 gm IV 6 hourly) and phenoxy methyl penicillin .
Penicillinase resistant penicillin like meticillin and flucloxacillin.
Aminopenicillin like Ampicillin and amoxicillin.
Antipseudomonus peniciliin like ticarcillin and pipercillin .

b- Monobactum like Aztreonam 1-2 gm IV against G-ve only no effect on G+ve and anaerobes .

c- Carbopenems like imipenem, ertapenem, doripenem and meropenem 500 mg -1 gm. Infusion 8 hourly against G-ve , G+ve and anaerobes very expensive .

d- B –Lactamase inhibitors like clavulanic acid if it added to amoxicillin –calvullanic acid (augmentin) 625mg TID effective against staphylococci bacteria .

e- Cephalosporine 1st -4th generation cephalosporine .Cefamycine have significant anti-anaerobic infection .

1st generation like cephalexine good activity agaist G+ve and weak agaist G-ve bacteria .

2nd generation like cefuroxime some activity against G+ve and good anti G-ve bacteria and some anti anerobic activity .
3rd generation like ceftazidime ,cefotaxime has good activity against G-ve bacteria loosing activity against G+ve bacteria except ceftriaxone vial which act against G-ve bacteria , antipseudomonus bacteria ,large spectrum of G+ve bacteria and antistaphylococcal bacteria .

4th generation like cefepime only available parentral form has broad spectrum activity little against Enterococci and anerobs. Its side effects Clostridia difficile enteritis .

2- Macrolides : Good against G+ve bacteria ,mycoplasma ,chlamydia and reckettsial infection .These include erythromycin ,clrithromycin, spirmycin and azithromycin . ketolides is new dervitives of macrolides given when resistance to penicillin and macrolides like telithromycin .
3- Lincosamide :Like lincomycin and clindamycin It is against G+ve when allergic to penicillin and anti-anaerobic infection ,side effect pseudomembranous colitis .
4- Aminoglycosides :Most popular Gentamycin which act against most G+ve and G-ve bacteria usually given in dose 3-5 mg |kg it is nephrotoxic and ototoxic drug and contraindicated in myasthenia gravis and hypomagnesemia .
5- Quinolones like Nalidixic acid act aginst G-ve not pseudomonas bacteria and fluoroquinolon like ciprofloxacine ,norfloxacine ,ofloxacin act against G-ve including pseudomonas and haemophilus influenza bacteria .Levofloxacine it act also against haemophilus ,pneumococci and atypical respiratory tract infection

. Moxifloxacin act against pneumococci ,staphylococci , anaerobic infection and mycobateria .

6- Glycopeptides : Vancomycin and teichoplanin : Act against G+ve bacteria including MRSA and enterococci . Given by slow infusion to prevent red man syndrome and it induce histamine release lead to allergy and bronchospasm .

7- Folate antagonist : Sulphonamide it is bactericidal antibiotics by inhibiting cell wall synthesis by inhibiting folic acid so it should give folic acid in long term use or if it is used unavoidable in pregnancy .It act against most of G +VE and –ve bacteria it cause skin reaction ,allergy including steven –johnson reaction ,cause hemolysis in G6pD deficiency and methohemoglobinemia . If use sulfmethoxazole + trimethoprim (co-trimoxazole)(methoprim) in high doses 120 mg |kg first line to treat pneumocystis carini (jirovicii) . Or pyrimetamine + sulfadoxine (fansidar) to treat malaria , sulfadiazine is use to treat toxoplasmosis .

8- Tetracyclines and glycyclines : Tetracycline , doxycycline and minocyclin. Mainly used for Brucellosis , mycoplasma ,Chlamydia , spirochetes and Rickettsia .
It is avoided in renal failure except Doxycycline which can be used ,and it cause hypernatremia so it used for hyponaetremia .
Glycycline is chemical modification of tetracyclines it is broad spectrum drug against G+ve and G-v bacteria especially MRSA .It is only available for intravenous infusion 100 mg then 50 mg ,12 hourly .

9- Chloumphenicol : It is broad spectrum antibiotic against aerobic and anaerobic bacteria G+ve and G –ve bacteria and against Brucellosis , mycoplasma ,Chlamydia , spirochetes and Rickettsia. The dose is 50 mg| kg ,4 times a day . Its side effects is reversible aplastic anemia ,dose dependent > 4gms |day or > 25 gm totally ,or irreversible aplastic anemia which is not dose dependent and irreversible ,because this life threatening complication the drug use is limited for meningitis due to Nisseria ,haemophilus

Influenzae and enteric fever or to life threatening infection not responding to another antibiotics .

10 Nitroimidazole (Metronidazole and tinidazole) : It is used for anaerobic infection including Bacteroids ,clostridia ..etc. and anti- Amoeba and Giardia and it is used as radio sensitizing agent in radiotherapy of the tumor. It is safe in pregnancy .

11 Oxazolindinones : It act against G+ve including MRSA These includes , Linezolid and streptogramins .

12 Quiapristin |Dalfopristin (3:7) combination : It is a new drug combination for serious G+ve drugs the dose 7.5 mg |km 8 hourly.

13 Fusidic acid :It act against most of G+ve bacteria ,MRSA it is used topically, intravenously and oral it is common topical and used systemically for serious infections.

14 Spectinomycin : It is chemically similar to aminoglycosides antibiotics used against neisseria gonorrhea and in pregnancy .

15 Daptomycin : It is used for G +ve bacteria only in serious infection ,soft tissue infection and infective endocarditis it cause increase creatinin kinase enzyme so patients on statin drugs should stop medication to avoid myopathy .

16 Fidaxomicin :It is new medication in 2012 used to treat clostridia defficile infection .