2nd Generation Cephalosporin

Cephalosporins are beta-lactam antibiotics that are derived from Acremonium fungus. Like other beta-lactams, these antibiotics work by inhibiting bacterial cell wall synthesis. However, they are not as susceptible to penicillinases. There are traditionally five generations of cephalosporins classified based on their antimicrobial characteristics. Each new generation provides a more extended spectrum and has greater gram negative bactericidal properties than the previous generation. Second generation cephalosporins such as cefoxitin, cefaclor and cefuroxime are affective against proteus mirabilis, E coli, Klebsiella, hemophilus influenza, enterobacter, Neisseria, serratia marcescens and gram-positive cocci.

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Drug Names

Cefoxitin
Chef-fox
This second generation cephalosporin antibiotic (trade name Mefoxin) is used for gram negatives, gram positive and even anaerobes. While a strong beta-lactamase inhibitor, it may not be active against pseudomonas and enterococci.

Cefaclor
Chef-core
This second generation cephalosporin antibiotic (trade name Ceclor, Keflor, and Raniclor) can be used to treat septicemia, pneumonia, peritonitis, UTIs, and biliary tract infections. It is active against gram-positive cocci and a few gram-negative bacteria.

Cefuroxime
Chef-furry-ox
Unlike other second generation cephalosporins, this second generation cephalosporin antibiotic (trade name Zinacef) can cross the blood-brain-barrier and is active against haemophilus influenzae, neisseria gonorrhea and lyme disease.

Indications (PEcK HENS Mnemonic)

Proteus mirabilis
Prometheus
A gram negative bacilli that is facultative anaerobic with swarming motility and urease presence. It cannot metabolize lactose on MacConkey agar. It is most commonly known for causing nosocomial infections. It can alkalinize urine and lead to struvite crystal formation in the urine and lead to large kidney stones. It can also cause other infections of the skin and lungs.

E. coli
E-coal-eye
Escherichia coli, commonly abbreviated E. coli, is a gram negative bacilli often found as normal flora in the intestines. Most E. coli strains are harmless but pathogenic strains can cause disease including food poisoning, neonatal pneumonia and meningitis, septic shock, and UTIs.

Klebsiella
Clubbing-sea-lion
Klebsiella is a gram negative, oxidase negative bacilli with a prominent polysaccharide capsule. Infections can lead to wide range of diseases including pneumonia and nosocomial urinary tract infections.

Gram-Positive Cocci
Graham-cracker Positive-angel with Cock-eyes
A group of bacteria classified by a dark blue gram stain due to high amounts of peptidoglycan in the cell wall as well as the coccus or spherical shape. Gram positive cocci include the staphylococcus genus and streptococcus genus. These bacteria can cause infection of various organs, skin and tissue.

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Haemophilus influenzae

Heme-man in Flute

Haemophilus influenzae is a gram negative coccobacillus that can cause several diseases including meningitis, pneumonia, otitis media, and epiglottitis.

Enterobacter

Intestinal-bacteria

A genus of gram negative bacillus and facultatively anaerobic bacteria that commonly causes urinary tract and respiratory tract infection.

Neisseria

Knife

Neisseria are a class of Gram negative diplococci that includes Neisseria gonorrhoeae and Neisseria meningitidis. Neisseria gonorrhoeae causes the sexually transmitted infection gonorrhea and Neisseria meningitidis causes meningitis and life threatening sepsis.

Serratia marcescens

Serrated-knife

This is a gram negative bacillus bacterium in the enterobacteriaceae family that causes nosocomial infections such as wound, urinary tract or respiratory tract infections. It can grow in a moist environment and present as a pink and red film.

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