

Cephalosporins Overview

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.



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Mechanism of Action

Beta lactam drug

[\(B lac\) Black Beta-fish](#)

This is a class of antibiotics that contain a beta lactam group in their molecular structures, and these antibiotics include penicillins, cephalosporins, monobactams, and carbapenems. Beta-lactam antibiotics work by inhibiting cell wall biosynthesis. Unlike other beta lactam antibiotics, cephalosporins have a higher resistance to beta lactamases and are therefore more effective and cover more bacterial infections.

Inhibits cell wall synthesis

[Breaking Wall](#)

Beta lactam antibiotics all work by inhibiting bacterial cell wall biosynthesis which eventually leads to bacteria cell death.

Bactericidal

[Bacteria-sliders](#)

Unlike bacteriostatic agents, which simply stop bacteria from reproducing, bactericidal agents actually cause bacterial cell death.

Side Effects

Hypersensitivity reactions

[Hiker-sensitive-crying](#)

Some individuals with penicillin hypersensitivity demonstrate cross reactivity with cephalosporins due to the fact that these antibiotics are structurally related. Therefore, people with a history of penicillin allergy are typically not given cephalosporins. These hypersensitivity reactions are characterized by an overreaction of the body's immune response to the antibiotic. Common symptoms include rashes, hives, itchy eyes, and swollen tongue or face. Some individuals can have an anaphylactic reaction.

Vitamin K Deficiency

[Viking \(K\) King](#)

Prolonged antibiotic use can deplete the normal gut flora which plays a role in the activation of vitamin K. Therefore chronic antibiotic use, especially chronic cephalosporin use, can result in vitamin K deficiency with subsequent clotting deficiencies.

Disulfiram like reaction with Alcohol

Dyed-shirt-surfer with Alcohol-bottles

Patients who consume alcohol within 72 hours after taking a cephalosporin can develop a disulfiram-like reaction. This is characterized by Flushing, fast heartbeats, nausea, thirst, chest pain, vertigo, and low blood pressure. The reaction occurs as a result of accumulation of acetaldehyde due to inhibition of acetaldehyde dehydrogenase.

Increased Nephrotoxicity of Aminoglycosides

Up-arrow Amigo-glider Stabbing Up-arrow Kidney with Toxic-green-glow

Cephalosporins and aminoglycosides demonstrate a synergistic nephrotoxic interaction when used in combination.