

Piperacillin*

Class: β -lactam

Overview

Along with mezlocillin and azlocillin, piperacillin is a ureidopenicillin developed for additional activity against *Klebsiella* and *Enterobacter* species, and *Pseudomonas aeruginosa*. The drug is a derivative of ampicillin, an acyl side chain along with a piperazine group is added to the original molecule, and has similar activity against streptococcal species. Piperacillin is poorly absorbed because it is hydrolyzed by acids in the stomach. Carboxypenicillins, another penicillin group with enhanced activity against *Pseudomonas aeruginosa* and ureidopenicillins can precipitate the side effects of hypokalemia and hypernatremia, although side effects are generally less common with the latter.

Piperacillin also acts through interference with cell wall synthesis.

Resistance

Some *Pseudomonas aeruginosa* strains have developed resistance to piperacillin by plasmid or chromosomal transfer of the ability to produce effective β -lactamases.

Effectiveness

Piperacillin and, in general, the ureidopenicillins are utilized primarily against *Pseudomonas* infections of the urinary tract, lung and blood. The drug also is very effective against *Enterococcus* species. In addition the ureidopenicillins exhibit enhanced activity against other aerobic Gram-negative organisms. Piperacillin specifically is used in infections caused by several *Shigella* and *Proteus* species and a few *Citrobacter* and *Enterobacter* species. This antimicrobial is also commonly used in the treatment of burn patients. Piperacillin is often combined with tazobactam, a β -lactamase inhibitor, to combat the production of β -lactamases by Gram-negative bacteria.

***References available by request. Call the Infectious Disease Epidemiology Section, Office of Public Health, Louisiana Department of Health and Hospitals (504-219-4563)**