

PIPERACILLIN-TAZOBACTAM

Broad-spectrum penicillin that inhibits bacterial cell wall synthesis.

Combination of β -lactam (piperacillin) and β -lactamase inhibitor (tazobactam)

Formulation: Only IV containing 4g piperacillin / 0.5g tazobactam, 3g piperacillin / 0.75g tazobactam, 2g piperacillin / 0.25g tazobactam

ANTIMICROBIAL SPECTRUM

Currently the penicillin with the broadest spectrum:

- ▣ Many **Gram-negative bacilli**, including the majority of *Pseudomonas aeruginosa* and some extended spectrum β -lactamase (ESBL)-producing *Enterobacterales*.
- ▣ **Strict anaerobes.**
- ▣ *Enterococcus faecalis*, penicillin-susceptible streptococci (including *Streptococcus pneumoniae*), meticillin-susceptible *Staphylococcus aureus*.

ROUTE

IV



EXCRETION

Excreted unchanged by the kidney, altered clearance in patients with renal impairment.

MAIN INDICATIONS

Any situation where broad-spectrum coverage is deemed necessary, taking into account local epidemiology to avoid clinical failure:

1. Empirical treatment of healthcare-associated infections.
2. Empirical treatment of fever in high-risk neutropenic patients.
3. Polymicrobial infections (e.g., complicated intra-abdominal infections or cellulitis).

ADULT DOSE

- ▣ **Intermittent dosing:** 4 g every 8 h
- ▣ **Use higher dose** (4 g every 6 h) for critically ill patients, for *P. aeruginosa* infections and a lower dose (4 g every 12 to 24 h for patients with renal impairment)
- ▣ **Continuous infusion to be preferred in severe infections:** loading dose of 4 g over one hour, immediately followed by continuous infusion, 12-16 g/day in patients with normal renal function

Dosing in patients with renal failure

- Creatinine clearance 20-40 mL/min: 4 g every 12 h
- Creatinine clearance <20 mL/min: 3 g every 12 h

SIDE EFFECTS

! Allergy

! Nephrotoxicity



CAUTIONS

- Contra-indicated for patients with immediate penicillin allergy (Type I hypersensitivity reactions).
- Avoid combination of vancomycin with piperacillin-tazobactam as the risk of acute kidney injury is higher than with other antibiotics.
- Drug susceptibility testing mandatory for *Pseudomonas aeruginosa* and ESBL-producing *Enterobacterales* (piperacillin-tazobactam clinically active only if MIC < 8 mg/L).

MONITORING

- Monitoring is not necessary in patients with stable kidney function.
- Twice-weekly monitoring of serum creatinine is required if duration of therapy is >3 days, in obese, hemodynamically unstable patients, patients with fluctuating kidney function, or if concomitant nephrotoxic drugs.



PREGNANCY

FDA Category

B

Moderately safe for the foetus

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