

CLASS and MECHANISM:

Semi-synthetic anti-staphylococcal penicillin, resistant to penicillinase; binds to penicillin-binding proteins on bacterial surface → inhibition of cell wall synthesis

SPECTRUM (predictably susceptible)

Gram positive	Gram negative	Anaerobes	Other
<i>Staphylococcus aureus</i> (MSSA) <i>Staphylococcus lugdunensis</i> <i>Streptococcus</i> Gr A/B/C/F	None	None	None

MAIN USES

- Empiric therapy for skin and soft tissue infections
- Targeted therapy (if organism isolated and susceptible) for endocarditis, bone/joint infections, central-line associated bacteremia, CNS infections

COMMON ADVERSE EVENTS:

- **Hypersensitivity reactions: Allergies to beta-lactams often mis-diagnosed.** Labeling patient as allergic can lead to treatment with less effective, more toxic or more expensive drugs. **Recommend careful history, risk stratification +/- Allergy consultation for skin testing and oral challenge to remove label.**
 - Type 1 (immediate hypersensitivity): onset < 72h, mediated by IgE; mastocyte and basophil degranulation and histamine release → anaphylaxis, edema, urticaria, bronchospasm (1-5/10,000 cases treated with penicillin)
 - Type 2 (cytotoxic reaction): onset > 72h, mediated by IgG/IgM, Antibody binds to drug-hapten complex on target cells and cell destruction via complement. Manifested by hemolytic anemia (Coombs +), thrombocytopenia, neutropenia.
 - Type 3 (immune complex reaction): onset > 72h, mediated by IgG/IgM; deposition of antigen-antibody complexes on tissues, leading to serum sickness, small vessel vasculitis (including damage to kidneys)
 - Type 4 (delayed hypersensitivity): onset > 72h, mediated by T lymphocytes – their activation leads to release of cytokines and chemokines, manifested by skin (morbilliform) eruptions; can lead to severe cutaneous drug reactions (SCARs; include DRESS, AGEP, SJS/TEN)
- **Skin:** rash can occur in association with certain viral infections (EBV, HIV, CMV, ..)
- **Burning sensation during IV infusion, and phlebitis at site of IV infusion**
- **GI:** abdominal cramping, nausea/vomiting, diarrhea are frequent [low risk of *C. difficile* infection]
- **Genito-urinary:** candida vaginitis

DRUG MONITORING:

- Check for symptoms and signs compatible with hypersensitivity reactions, rash, phlebitis, or other adverse events
- Recommended blood tests for prolonged (> 2 weeks) treatment: CBC, renal function, liver profile
- Therapeutic drug monitoring not available