ampicillin/sulbactam (am-pi-sil-in/sul-bak-tam)

Classification
Therapeutic: anti-infection
Pharmacologic: aminopenicillins/beta lactamase inhibitors

Pregnancy Category B

Indications
Treatment of the following infections: Skin and skin structure infections, soft-tissue infections, Middle, intra-abdominal infections, Sinositis, Respiratory infections, Gonococcal infections, Meningitis, Septicemia.

Action
Binds to bacterial cell wall, resulting in cell death; Spectrum is broader than that of penicillin. Addition of sulbactam increases resistance to beta-lactamases, enzymes produced by bacteria that may inactivate ampicillin.

Therapeutic Effects: Bactericidal action.


Pharmacokinetics
Absorption: Well absorbed from IM sites.
Distribution: Ampicillin diffuses readily into bile, blister and tissue fluids. Poor CSF penetration unless meninges are inflamed. Crosses the placenta; enters breast milk in small amounts.
Metabolism and Excretion: Ampicillin is variably metabolized by the liver (12–50%). Renal excretion is also variable. Sulbactam is eliminated unchanged in urine.
Protein Binding: Ampicillin—28%; sulbactam—38%.
Half-life: Ampicillin—1–1.8 hr; sulbactam—1–1.3 hr.

TIME/ACTION PROFILE (blood levels)

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<tbody>
<tr>
<td>IV</td>
<td>rapid</td>
<td>end of infusion</td>
<td>6–8 hr</td>
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Contraindications/Precautions
Contraindicated in: Hypersensitivity to penicillins or sulbactam.
Use Cautionally in: Severe renal insufficiency (dosage reduction required if CrCl <30 mL/min). Epigastriac ulcer, severe pre-existing anemia, history of allergies, infants, lactating women. Discontinue if rash develops.

Adverse Reactions/Side Effects
CNS: SEIZURES (high doses).

Interactions
Drug-Drug: Probenecid decreases renal excretion and increases blood levels of ampicillin—therapy may be combined for this purpose. May potentiate the effect of warfarin. Concurrent antifungal therapy (increased incidence of rash). May decrease the effectiveness of hormonal contraceptives.

Route/Dosage
Dosage based on ampicillin component.

IM, IV (Adults and Children ≥12 yr): 1–2 g ampicillin q 6–8 hr (not to exceed 12 g ampicillin/day).
IM, IV (Children 1–12 yr): 100–200 mg ampicillin/kg/day divided q 6 hr. Meningitis—200–400 mg ampicillin/kg/day divided every 6 hr, maximum dose: 8 g ampicillin/day.
IM, IV (Infants ≤1 mo): 100–150 mg ampicillin/kg/day divided q 6 hr.

Renal Impairment
IM, IV (Adults, Children, and Infants): CrCl 15–29 mL/min—administer q 12 hr; CrCl 5–14—administer q 24 hr.

Nursing Implications
Assessment
• Assess patient for infection (tympanic signs, wound appearance, sputum, urine, stool, and WBCs) at beginning and throughout therapy.
• Obtain a history before initiating therapy to determine previous use of, and reactions to, penicillins or cephalosporins. Persons with a negative history of penicillin sensitivity may still have an allergic response.

● Obtain specimens for culture and sensitivity before therapy. First dose may be given before receiving results.

● Observe patient for signs and symptoms of anaphylaxis (rash, pruritus, laryngeal edema, breathing difficulties) and discontinue the drug and notify the physician or other health care professional immediately if they occur. Seek epinephrine, antihistamines, and resuscitation equipment close by in the event of an anaphylactic reaction.

● Lab Test Considerations: May cause increased AST, ALT, LDH, bilirubin, alkaline phosphatase, BUN, and creatinine.

● May cause decreased hemoglobin, hematocrit, HbC, WBC, neutrophils, and lymphocytes.

● May cause transient decreases in estradiol, total conjugated estriol, estriol-glucuronide, or conjugated estrone in pregnant women.

● May cause a false-positive Coombs’ test result.

Potential Nursing Diagnoses

Risk for infection (Indications) (Side Effects)

Implementation

● IM: Reconstitute for IM use by adding 3.2 mL of sterile water or 0.5% or 2% lidocaine HCl to the 1.5-g vial or 6.4 mL to the 3-g vial. Administer within 1 hr of preparation, deep IM into well-developed muscle.

● IV Administration

● pH: 6.2–7.2

● Direct IV: Diluent: Reconstitute 1.5 g with 3.2 mL of sterile water for injection and the 3-g vial with 6.4 mL. Concentrations: 25 mg ampicillin/sulbactam per mL. Rate: Administer over at least 10–15 min within 1 hr of reconstitution. More rapid administration may cause seizures.

● Intravenous Infusion: Diluent: Reconstitute vials as per the directions above. Further dilution in 50–100 mL of 0.9% NaCl, .45% NaCl, or LR. Stability of solution varies from 2–4 hr at room temperature or 1–3 hr if refrigerated, depending on concentration and diluent. Concentrations: Final concentration of infusion should be 3–45 mg of ampicillin/sulbactam per mL. Rate: Infuse over 15–30 min.

● Y-Site Compatibility: anidulafungin, bivalirudin, daptomycin, fenoldopam, filgrastim, fluconazole, granisetron, hydromorphone, levofloxacin, linezolid, palonosetron, pantoprazole, promethazine, propofol, voriconazole.

● Y-Site Incompatibility: acyclovir, amiodarone, amphotericin B, ampicillin, aspirin, atorvastatin, azithromycin, brilliant green, calcium chloride, cephalothin, cefoperazone, cefotaxime, cefuroxime, ciprofloxacin, clindamycin, cyclophosphamide, dexamethasone, diazepam, doxorubicin, doxycycline, epinephrine, etoposide, famotidine, fentanyl, ferrous sulfate, famotidine, fluconazole, fluoxetine, furosemide, gamma globulin, gentamicin, gentamicin, gliclazide, ganciclovir, heparin, hydrocortisone, hydrocortisone, hydroxyzine, hydrazine sulfate, hydromorphone, indomethacin, insulin, isosorbide dinitrate, isoproterenol, itraconazole, ketorolac, levodopa, lidocaine, linezolid, loracarbef, lornoxicam, lorazepam, luteinizing hormone, magnesium sulfate, methotrexate, methylprednisolone sodium succinate, midazolam, midostaurin, milrinone, morphine, norepinephrine, palonosetron, pentazocine, pantoprazole, propofol, quinine, racemic epinephrine, ranitidine, raloxifene, ranolazine, raloxifene, ranolazine, ritonavir, rocuronium, somatropin, strontium chloride, sucralfate, sucralfate, succinylcholine, tacrolimus, teicoplanin, thiopental, ticagrelor, tiotropium, tolazoline, tizanidine, tolterodine, tobramycin, trazodone, tromethamine, verapamil, vinblastine, vincristine, vancomycin, voriconazole, warfarin.