Aztreonam (az-tree-oh-nam)

**Aztreonam**

**Classification:** Anti-infectives

**Pharmacologic MANUFACTURERS:**

**Pregnancy Category:** B

**Indications**

Treatment of serious gram-negative infections including: Septicemia, Skin and skin structure infections, Intra-abdominal infections, Gynecologic infections, Respiratory tract infections, Urinary tract infections. Useful for treatment of multi-resistant strains of some bacteria including aerobic gram-negative pathogens. **Inhaln:** To improve respiratory symptoms in cystic fibrosis (CF) patients with *Pseudomonas aeruginosa*.

**Action**

Binds to the bacterial cell wall membrane, causing cell death. **Therapeutic Effects:** Bactericidal action against susceptible bacteria. **Spectrum:** Displays significant activity against gram-negative aerobic organisms only: *Escherichia coli*, *Serratia*, *Klebsiella oxytoca or pneumoniae*, *Citrobacter*, *Proteus mirabilis*, *Enterobacter aerogenes*, *Enterobacter*, *Hafnia enterolobatis*. Not active against: *Staphylococcus aureus*, *Enterococcus*, *Bacteroides fragilis*, *Streptococci*.

**Pharmacokinetics**

**Absorption:** Well absorbed following IM administration. Low absorption follows administration by inhalation.

**Distribution:** Widely distributed. Crosses the placenta and enters breast milk in low concentrations. High concentrations achieved in sputum with inhalation.

**Protein Binding:** 56%.

**Metabolism and Excretion:** 60–70% excreted unchanged by the kidneys. 10% of inhaled dose excreted unchanged in urine. Small amounts metabolized by the liver.

**Half-life:** Adults: 1.5–2 hr; Children: 1.7 hr; Neonates: 2.4–9 hr (in renal impairment).

**TIME/ACTION PROFILE (blood levels)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>IM</td>
<td>rapid</td>
<td>60 min</td>
<td>6–8 hr</td>
</tr>
<tr>
<td>IV</td>
<td>rapid</td>
<td>end of infusion</td>
<td>6–8 hr</td>
</tr>
<tr>
<td>Inhaln</td>
<td>rapid</td>
<td>unknown</td>
<td>Several hours</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**

**Contraindicated in:** Hypersensitivity.

**Use Cautiously in:** Renal impairment (dosage required if CCr 30 mL/min or less); Cross-sensitivity with penicillins or cephalosporins may occur rarely. Has been used safely in patients with a history of penicillin or cephalosporin allergy; Patients with FEV1 < 25% or < 75% predicted, or patients colonized with *Burkholderia cepacia* (safety and effectiveness not established); GI: Lactation: Safety not established; Geri: Consider age-related in renal function.

**Adverse Reactions/Side Effects**

**CNS:** SEIZURES.

**EENT:** nasal congestion (inhalation), nasopharyngeal pain (inhalation).

**CV:** chest discomfort (inhalation).

**GI:** PSEUDOMEMBRANOUS COLITIS, abdominal pain (inhalation), altered taste, diarrhea, nausea, vomiting.

**Resp:** cough (inhalation), wheezing (inhalation), bronchospasm (inhalation).

**Derm:** rash.

**Local:** pain at IM site, phlebitis at IV site.

**Misc:** allergic reactions including anaphylaxis, fever (inhalation), superinfection.

**Interactions**

**Drug-Drug:** Serum levels may be q by furosemide or probenecid.

**Product Information**

**Route/Dosage**

**IM, IV (Adults):**

- Moderately severe infections—1–2 g q 6–8 hr; severe or life-threatening infections (including those due to *Pseudomonas aeruginosa*)—2 g q 6–8 hr; urinary tract infections—0.5–1 g q 8–12 hr.

**IV (Children 1 mo–16 yr):**

- Mild to moderate infections—30 mg/kg q 8 hr; moderate to severe infections—30 mg/kg q 6–8 hr; urinary tract infections—30 mg/kg q 6–8 hr; cystic fibrosis—50 mg/kg q 6–8 hr.

**IV (Neonates < 1 kg):** 30 mg/kg q 8–12 hr.

**IV (Neonates > 1 kg):** 30 mg/kg q 6–8 hr.

**Inhaln (Adults and Children ≥ 7 yr):** 75 mg three times daily for 28 days.

**Indications (Adults and Children > 7 yr):** 75 mg three times daily for 28 days.

**Dosing:**

**Discontinue**:
Renal Impairment

Adults: CCr 10–30 mL/min—1–2 g initially, then 50% of usual dosage at usual interval; CCr 10 mL/min—500 mg-2 g initially, then 25% of usual dosage at usual interval (1/8 of initial dose should also be given after each hemodialysis session).

NURSING IMPLICATIONS

Assessment

- Assess for injection-site pain, redness, swelling, and temperature.
- Assess renal function and daily weights.

Implementation

- Administer slowly. Monitor patient’s vital signs and observe for signs of anaphylaxis (rash, pruritus, urticaria, angioedema).
- Monitor for signs of infection (vital signs, wound appearance, sputum, urine, and stool; WBC) at beginning of and throughout therapy.
- Obtain a history before initiating therapy. The patient’s renal function should be monitored during therapy. Nonsteroidal anti-inflammatory drugs may be discontinued if the patient’s renal function is impaired.
- Monitor respiratory status prior to and following inhalation therapy.
- Observe for signs and symptoms of anaphylaxis (rash, pruritus, laryngeal edema, wheezing) and report promptly. Notify the health care professional immediately if these occur.
- Monitor bowel function. Report diarrhea, abdominal cramping, fever, and bloody stools to health care professional promptly as a sign of pseudomembranous colitis. May begin up to several weeks following cessation of therapy.
- Lab Test Considerations: May cause an increase in AST, ALT, alkaline phosphatase, LDH, and serum creatinine. May cause positive Coombs' test.

Potential Nursing Diagnoses

- Risk for infection (Indications)
- Ineffective airway clearance (Indications)

IM: Use 5 mL to administer each gram of aztreonam with at least 5 mL of 0.9% NaCl, or sterile or bacteriostatic water for injection. Stable at room temperature for 5 days or refrigerated.

IV: Use 15 mL to administer each gram of aztreonam with at least 5 mL of sterile water for injection. Stable at room temperature for 5 days or refrigerated.

IV: Administer into large, well-developed muscle.
aztreonam

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CONTINUED

side, amphotericin B colloidal, amphotericin B liposome, amoxicillin, amoxicillin/clavulanate, astemizole, atraconazole, azithromycin, chlorpromazine, dantrolene, daunorubicin hydrochloride, diazepam, diazoxide, erythromycin, ganciclovir, indomethacin, lorazepam, metronidazole, mitomycin, mitoxantrone, mycophenolate, pantoprazole, papaverine, pentamidine, pentazocine, pentobarbital, phenytoin, prochlorperazine, streptozocin, tacrolimus, teniposide, theophylline, thiamine, thiotepa, ticarcillin/clavulanate, tigecycline, tirofiban, tobramycin, tolazoline, triamcinolone acetonide, vasopressin, vecuronium, verapamil, vinblastine, vincristine, vinorelbine, voriconazole, zidovudine, zoledronic acid.

● Y-Site Incompatibility: acyclovir, amphotericin B colloidal, amphotericin B liposome, amoxicillin, aztreonam, chlorpromazine, dantrolene, daunorubicin hydrochloride, diazepam, diazoxide, erythromycin, ganciclovir, indomethacin, lorazepam, metronidazole, mitomycin, mitoxantrone, mycophenolate, pantoprazole, papaverine, pentamidine, pentazocine, pentobarbital, phenytoin, prochlorperazine, streptozocin, tacrolimus, teniposide, theophylline, thiamine, thiotepa, ticarcillin/clavulanate, tigecycline, tirofiban, tobramycin, tolazoline, triamcinolone acetonide, vasopressin, vecuronium, verapamil, vinblastine, vincristine, vinorelbine, voriconazole, zidovudine, zoledronic acid.

● Inhalation: Open glass aztreonam vial by removing metal ring and pulling tab, and removing gray rubber stopper. Twist tip of diluent ampule and squeeze contents into glass aztreonam vial. Replace rubber stopper and swirl gently until contents are completely dissolved. Administer immediately after reconstitution using Al-tera Nebulizer System. Pour reconstituted solution into handset of nebulizer. Turn unit on. Place nebulizer into mouth and breathe normally only through mouth. Administration takes 2–3 min. Do not use other nebulizers or mix with other medications. Do not administer IV or IM. Refrigerate aztreonam and diluent; may be stored at room temperature for up to 28 days. Protect from light.

● Administer short-acting bronchodilator between 15 min and 4 hr or long-acting bronchodilator between 30 min and 12 hr prior to treatment. If taking multiple inhaled therapies, administer in the following order: bronchodilator, mucolytic, and lastly, aztreonam.

Patient/Family Teaching

● Advise patient to report the signs of superinfection (furry overgrowth on the tongue, vaginal itching or discharge, loose or foul-smelling stools) and allergy.

● Instruct patient to notify health care professional if fever and diarrhea develop, especially if stool contains blood, pus, or mucus. Advise patient not to treat diarrhea without consulting health care professional.

● Advise patient to notify health care professional if new or worsening symptoms or signs of amphotericin occur.

● Inhalation: Instruct patient to use aztreonam as directed for the full 28-day course, even if feeling better. If dose is missed, take all 3 daily doses, allowing at least 4 hrs between doses. Slipping doses or not completing full course of therapy may decrease effectiveness and increase likelihood of bacterial resistance not treatable in the future. Instruct patient of the importance of using a bronchodilator prior to treatment and to use an anti-inflamatory or sedolect.

Evaluation/Desired Outcomes

● Resolution of signs and symptoms of infection. Length of time for complete resolution depends on the organism and site of infection.

● Improvement in respiratory symptoms in patients with cystic fibrosis.

Why was this drug prescribed for your patient?