**linezolid (li-nez-o-lid)**

**Zyvox, Zyvoxam**

**Classification**
Therapeutic: anti-infectives
Pharmacologic: oxazolidinones

**Pregnancy Category C**

**Indications**
Treatment of:
- Infections caused by vancomycin-resistant *Enterococcus faecium*.
- Nosocomial pneumonia caused by *Staphylococcus aureus* (methicillin-susceptible and -resistant strains).
- Complicated skin/skin structure infections caused by *Staphylococcus aureus* (methicillin-susceptible and -resistant strains).
- *Streptococcus pyogenes* or *Streptococcus agalactiae* (including diabetic foot infections).
- Uncomplicated skin/skin structure infections caused by *Staphylococcus aureus* (methicillin-susceptible and -resistant strains).
- *Streptococcus pyogenes*.
- Community-acquired pneumonia caused by *Streptococcus pneumoniae* (including multi-drug resistant strains) or *Staphylococcus aureus* (methicillin-susceptible strains only).

**Action**
Inhibits bacterial protein synthesis at the level of the 23S ribosome of the 50S subunit.

**Therapeutic Effects:**
Bactericidal action against streptococci; bacteriostatic action against enterococci and staphylococci.

**Pharmacokinetics**
**Absorption:** Rapidly and extensively (100%) absorbed following oral administration.
**Distribution:** Readily distributes to well-perfused tissues.
**Metabolism and Excretion:** 65% metabolized, mostly by the liver; 30% excreted unchanged by the kidneys.
**Half-life:** 6–8 hr.

**TIME/ACTION PROFILE**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>rapid</td>
<td>1 hr</td>
<td>12 hr</td>
</tr>
<tr>
<td>IV</td>
<td>rapid</td>
<td>end of infusion</td>
<td>12 hr</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**
**Contraindicated in:**
- Hypersensitivity; Phenylketonuria (suspension contains aspartame); Uncontrolled HTN, pheochromocytoma, thyrotoxicosis, or concurrent use of sympathomimetic agents, vasopressors, or dopaminergic agents (risk of hypertensive response).
- Concurrent or recent (2 wk) use of monoamine oxidase (MAO) inhibitors (risk of hypertensive response), Carcinoid syndrome or concurrent use of SSRIs, TCAs, triptans, meperidine, or buspirone (risk of serotonin syndrome).
- Use Cautiously in:
  - Thrombocytopenia, concurrent use of antiplatelet agents or bleeding diathesis (platelet counts should be monitored more frequently).
  - Diabetes (risk of hypoglycemia).
  - OB: Safety not established; use only if maternal benefit outweighs potential risk to fetus.
  - Lactation: Lactation.

**Adverse Reactions/Side Effects**
**CV:** headache, insomnia.
**EENT:** teeth discoloration, tongue discoloration.
**GI:** PSEUDOMEMBRANOUS COLITIS, diarrhea, increased liver enzymes, nausea, taste alteration, vomiting.
**Endo:** hypoglycemia.
**F and E:** lactic acidosis.
**Hemat:** thrombocytopenia.
**Neuro:** optic neuropathy, peripheral neuropathy.

**Interactions**
**Drug-Drug:** Risk of hypertensive response with MAO inhibitors, sympathomimetics (e.g., pseudoephedrine), vasopressors (e.g., epinephrine, norepinephrine), and dopaminergic agents (e.g., dopamine, dobutamine); concurrent or recent use should be avoided. Risk of serotonin syndrome with SSRIs, TCAs, triptans, meperidine, bupropion, or buspirone; avoid concurrent use.
 Rifampin, carbamazepine, phentolamine, and phenobarbital may increase levels. Concurrent use with oral hypoglycemics or insulin may risk of hypoglycemia.
**Drug-Food:** Because of monoamine oxidase inhibitory properties, consumption of large amounts of foods or beverages containing tyramine should be avoided. Risk of pressor response.

**Route/Dosage**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Route</th>
<th>Dosage</th>
</tr>
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<tbody>
<tr>
<td>Vancomycin-Resistant <em>Enterococcus faecium</em> Infections</td>
<td>PO, IV (Adults):</td>
<td>600 mg every 12 hr for 14–28 days.</td>
</tr>
</tbody>
</table>
PO, IV (Children birth-11 yr): (in the first week of life, pre-term neonates may initially receive 10 mg/kg every 12 hr).

Pneumonia, Complicated Skin/Skin Structure Infections
PO, IV (Adults): 600 mg every 12 hr for 10–14 days.
PO, IV (Children birth-11 yr): 10 mg/kg every 8 hr for 10–14 days (in the first week of life, pre-term neonates may initially receive 10 mg/kg every 12 hr).

Uncomplicated Skin/Skin Structure Infections
PO, IV (Adults): 400 mg q 12 hr for 10–14 days.
PO, IV (Children 5–11 yr): 10 mg/kg every 12 hr for 10–14 days.
PO, IV (Children <5 yr): 10 mg/kg every 8 hr for 10–14 days (in the first week of life, pre-term neonates may initially receive 10 mg/kg every 12 hr).

NURSING IMPLICATIONS

Assessment
- Assess for infection (vital signs, appearance of wound, sputum, urine, and stool, WBC) at beginning of and during therapy.
- Obtain specimens for culture and sensitivity prior to initiating therapy. First dose may be given before receiving.
- May cause lactic acidosis. Notify health care professional if recurrent nausea and vomiting, unexplained acidosis or low bicarbonate levels occur.
- Monitor vision function in patients receiving linezolid for 3 mo or who report visual symptoms (changes in acuity or color vision, blurred vision, visual field defects) regardless of length of therapy. If optic neuropathy occurs therapy should be reconsidered.
- Monitor bowel function. Diarrhea, abdominal cramping, fever, and bloody stools should be reported to health care professional promptly as a sign of pseudomembranous colitis. May begin up to several weeks following cessation of therapy.
- Monitor patient taking serotonergic drugs for signs of serotonin syndrome (hyperthermia, rigidity, myoclonus, autonomic instability, mental status changes (extreme agitation progressing to delirium and coma) for two weeks (five weeks if fluoxetine was taken) or until 24 hours after the last dose of linezolid, whichever comes first.

Lab Test Considerations: May cause bone marrow suppression, anemia, leukopenia, pancytopenia. Monitor CBC and platelet count weekly, especially in patients at risk for increased bleeding. May cause bone marrow suppression, receiving concurrent medications that may cause myelosuppression, or requiring >2 weeks of therapy. Discontinue therapy if bone marrow suppression occurs or worsens.
- May cause hyponatremia requiring decrease in dose of antidiuretic agent or discontinuation of linezolid.

Potential Nursing Diagnoses

Built-in infection (Indications)
Diarrhea (Adverse Reactions)

Implementation
- Dose adjustment is not necessary when switching from IV to oral dose.
- PO: May be administered with or without food.
- Before using oral solution gently invert 3–5 times to mix; do not shake. Store at room temperature.

IV Administration
- Interim Intusion: Diluents: Premixed solutions are already diluted and ready to use. Solution in vials is in a color which may slightly change without affecting its potency. Concentration: 2 mg/mL. Rate: Infuse over 30–120 minutes.Flush line before and after infusion.
- Y-Site Compatibility: acyclovir, albuterol, allopurinol, amifostine, amikacin, aminophylline, amiodarone, amphotericin B lipid complex, amphotericin B liposome, ampicillin, ampicillin/sulbactam, anidulafungin, argatroban, atracurium, azithromycin, aztreonam, bivalirudin, bleomycin, bumetanide, buprenorphine, busulfan, butorphanol, calcium acetate, calcium gluconate, carboplatin, carmustine, caspofungin, cefazolin, cefepime, cefotaxime, cefoxitin, ceftazidime, cefuroxime, chloramphenicol, ciprofloxacin, cisatracurium, cisplatin, clindamycin, cyclosporine, cytarabine, dactinomycin, daptomycin, desferrioxamine sodium phosphate, dexmedetomidine, dexamethasone, doxorubicin, doxorubicin liposome, doxycycline, droperidol, enalaprilat, ephedrine, epinephrine, eptifibatide, ertapenem, esmolol, etoposide, etoposide phosphate, famotidine,
linezolid

CONTINUED


Y-Site Incompatibility: amphotericin B colloidal, chlorpromazine, dantrolene, diazepam, pantoprazole, pentamidine, phenytoin, thiopental.

Patient/Family Teaching

- Advise patients taking oral linezolid to take as directed, for full course of therapy, even if feeling better. Take missed doses as soon as remembered unless almost time for next dose; do not double dose.

- Instruct patient to avoid large quantities of foods or beverages containing tyramine. May cause hypertensive response.

- Instruct patient to notify health care professional if patient has a history of hypertension or seizures.

- Advise patient to notify health care professional if changes in vision occur or immediately if diarrhea, abdominal cramping, fever, or bloody stools occur and not to treat with antidiarrheals without consulting health care professionals.

- Advise patient to notify health care professional if no improvement is seen in a few days.

Evaluation/Desired Outcomes

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

Why was this drug prescribed for your patient?