penicillamine (pen-i-sill-a-meen)

Cuprimine, Depen

**Classification**
- Therapeutic: antidotes, antirheumatics (DMARD), antiurolithics
- Pharmacologic: chelating agents

**Pregnancy Category D**

**Indications**

**Genetic Implication.** CAPI TALS indicate if life-threatening, underlines indicate most frequent. Strikethrough indicates discontinued.

**Contraindications/Precautions**
- Hypersensitivity; Cross-sensitivity with penicillin may exist; Patients currently receiving gold salts, antimalarials, antineoplastics, oxyphenbutazone, or phenylbutazone; Concurrent use of iron supplements; OB: Pregnancy (penicillamine should be avoided in pregnant patients with rheumatoid arthritis or cystinuria); OB: Lactation.

**Adverse Reactions/Side Effects**
- EENT: blurred vision, eye pain.
- Resp: coughing, shortness of breath, wheezing.
- GI: altered taste, anorexia, cholestatic jaundice, diarrhea, drug-induced pancreatitis, dyspepsia,nausea, vomiting.
- GU: proteinuria.
- Derm: pemphigus, ecchymoses, hives, itching, rashes, wrinkling.
- Hemat: aplastic anemia, anemia, eosinophilia, leukopenia, thrombocytopenia, thrombocytosis.
- MS: arthralgia, migratory polyarthritis.
- Neuro: myasthenia gravis syndrome.

**Interactions**
- Drug-Drug: Increased risk of adverse hematologic effects with antineoplastics, immunosuppressants, or gold salts (avoid concurrent use). Concurrent administration of iron supplements decreases absorption of penicillamine. May decrease serum digoxin levels.
- Drug-Food: May increase requirements for pyridoxine (vitamin B6).

**Route/Dosage**

**PO (Adults):**
- Antirheumatic—125–250 mg/day as a single dose; may be slowly increased up to 1.5 g/day. Chelating agent (Wilson’s disease)—250 mg qid.
- Antiurolithic—500 mg 4 times daily.

**PO (Children <6 mo):**
- Chelating agent (Wilson’s disease)—250 mg/day as a single dose; older children may receive the adult dose. Antiurolithic—7.5 mg/kg 4 times daily.

**TIME/ACTION PROFILE**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<tbody>
<tr>
<td>PO</td>
<td>1–7 hr</td>
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**Contraindicated in:** Hypersensitivity. Cross-sensitivity with penicillins may exist. Patients currently receiving gold salts, antimutagens, antineoplastics, nephrotoxins, or phenylbutazines. Concurrent use of iron supplements. OB: Pregnancy (penicillamine should be avoided in pregnant patients with rheumatoid arthritis or cystinuria). OB: Lactation.

**Use Cautiously in:** Renal impairment (increased risk of adverse renal reactions in patients with rheumatoid arthritis); History of aplastic anemia due to penicillamine; Patients requiring surgery (may impair wound healing); Geri: Geriatric patients (increased risk of hematologic toxicity; skin rash and taste abnormalities; dose reduction recommended). OB: Pregnancy (for patients with Wilson’s disease, limit daily dose to 1 g if cesarean section is planned; decrease daily dose to 250 mg for last week of pregnancy and until incision is healed).

**Contraindications/Precautions**

**Route/Dosage**

**PO (Adults):**
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**PO (Children <6 mo):**
- Chelating agent (Wilson’s disease)—250 mg/day as a single dose; older children may receive the adult dose. Antiurolithic—7.5 mg/kg 4 times daily.
**NURSING IMPLICATIONS**

**Assessment**
- Monitor intake and output and daily weight, and assess for edema during therapy.
- Notify physician or other health care professional if edema or weight gain occurs.
- Monitor patient for allergic reactions (rash, fever). Discontinue treatment and reinstitute at lower dose (250 mg/day), increasing gradually. Prednisone 20 mg/day may be administered for the first few weeks of therapy to decrease severity of reactions. Antihistamines may be used to control pruritus.
- Arthritis: Assess pain and range of motion periodically during therapy.
- Continues: Repeat laboratory tests for renal function and urinalysis (especially for protein and cells) at least every 1 wk during the first 6 mo of therapy or after dose change and monthly thereafter. May cause leukopenia, anemia, and thrombocytopenia. Discontinue therapy if WBC <3500/mm^3, neutrophils <2000/mm^3, monocytes <500/mm^3, or hematuria occurs.
- Monitor liver function tests every 6 mo during the first 18 mo of therapy.
- Monitor iron levels every 6 mo during therapy.
- May cause a positive ANA test result.
- May cause hypoglycemia.
- Arthritis: Monitor 24-hr urinary protein levels every 1–2 wk in patients with moderate proteinuria.
- Wilson’s disease: Monitor urinary copper levels before and soon after initiation of therapy and every 3 mo during continued therapy.
- Cystinuria: Monitor urinary cystine levels. Urinary cystine excretion should be maintained at 100–200 mg in patients without a history of calculi.

**Potential Nursing Diagnoses**
- Acute pain (Indications)
- Implementation
- Do not confuse penicillamine with penicillin.
- PO: Administer on an empty stomach, at least 1 hr before or 2 hr after meals. Other medications should be administered at least 1 hr apart from penicillamine to maximize absorption.
- Do not administer concurrently with products containing iron.
- Penicillamine increases the daily requirements for pyridoxine. Supplemental doses of pyridoxine (25 mg/day; vitamin B) may be required in patients with impaired nutrition.
- Arthritis: Dose adjustments may be required every 2–3 mo during therapy.
- Wilson’s Disease: If no improvement is seen after 5–6 mo of therapy with doses of 1–1.5 g/day, medication should be discontinued.

**Patient/Family Teaching**
- Instruct patient to take penicillamine as directed. If on once-daily schedule, take missed doses as soon as remembered unless remembered the next day; if on twice-daily schedule, take missed doses as soon as remembered unless almost time for next dose; if on more than twice-daily schedule, take missed doses within 1 hr of next dose. Do not double doses.
- General health care professional before discontinuation of therapy, as interruption of therapy may cause sensitivity reactions when therapy is resumed. Therapy should be resumed starting with smaller dose and increasing gradually.
- Instruct patient to notify health care professional of medication regimen before surgery or treatment. Dose of penicillamine should be reduced until wound healing is complete.
- Emphasize the importance of follow-up exams to check progress.
- Wilson’s Disease: Advise patient to discuss dietary restrictions with health care professional. Allow copper diet may be required. Chocolate, nuts, shellfish, mushrooms, liver, melons, broccoli, and cereals enriched with copper should be avoided. If drinking water contains >10 mcg/liter of copper, distilled or demineralized water should be used.
- Cystinuria: Advise patient to maintain a fluid intake of at least 2000–3000 mL/day, with increased fluids at night.
CONTINUED

penicillamine

● Advise patient to discuss dietary restrictions with health care professional. Low-methionine diet may be required to minimize cystine production but is contraindicated in growing children or pregnancy because of low protein content.

Evaluation/Desired Outcomes

● Decreased pain and increased range of motion in patients with rheumatoid arthritis.
● Prevention and treatment of symptoms of Wilson’s disease.
● Prevention and treatment of renal calculi in patients with excessive urinary cystine levels.

Why was this drug prescribed for your patient?