mercaptopurine (mer-kap-toe-pur-een)

**Classification**
Therapeutic: antineoplastics
Pharmacologic: antimetabolites

**Pregnancy Category D**

**Indications**

**Action**
Disrupts DNA and RNA synthesis (cell-cycle S phase– specific).

**Therapeutic Effects:**
Death of rapidly proliferating cells, especially malignant ones. Also has immuno-suppressant properties.

**Pharmacokinetics**
Absorption: Varably and incompletely (5– 50%) absorbed after oral administration.

Distribution: Widely distributed throughout total body water.

Metabolism and Excretion: Metabolized by liver; undergoes methylation via thiopurine methyltransferase (TPMT). Some metabolism by the GI mucosa. Nearly 50% is excreted unchanged by the kidneys.

Half-life: Three phases— 45 min, 2.5 hr, 10 hr.

**TIME/ACTION PROFILE (effects on blood counts)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>7–10 days</td>
<td>14 days</td>
<td>21 days</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**
Contraindicated in: Hypersensitivity; OB, Lactation: Pregnancy or lactation; Severe liver disease.

Use Cautiously in: Infections; Bone marrow reserve; Patients with TPMT enzyme deficiency; Thrombocytopenia; Anemia; Leukopenia; Thrombocytopenia; Anemia; Leukopenia; Thrombocytopenia.

**Adverse Reactions/Side Effects**
CNS: weakness.


**Drug-Drug:**
Allopurinol may alter the effect of mercaptopurine. A similar effect may occur with sulfasalazine, olsalazine, mesalamine, or radiation therapy. May alter the effect of warfarin. May alter the effect of other hepatotoxic agents. May alter the effect of other immunosuppressant drugs.

**Route/Dosage**
**PO (Adults):** Initial dose—2.5 mg/kg (80–100 mg/m²)/day as a single dose or divided doses; after 4 wk, if necessary, dose may be slowly increased to 5 mg/kg/day (dose should be rounded to the nearest 25 mg); maintenance dose—1.5–2.5 mg/kg (50–100 mg/m²)/day.

**PO (Children):** 2.5 mg/m²/day (75 mg/m²) single dose or divided doses (dose should be rounded to the nearest 25 mg).

**NURSING IMPLICATIONS**

**Assessment**
- Monitor BP, pulse, respiratory rate, and temperature frequently during therapy. Report significant changes.
- Monitor for bone marrow depression, increased risk of bleeding (bleeding gums, bruising, purpura; frank bleeding, nose, and mouth), and avoid 20% Intravenous and local temperatures of plasmapheresis to line. Apply pressure to puncture sites for 10 min. Assess for signs of infection during neutropenia. Anemia occurs. Monitor for increased fatigue, dyspnea, and orthostatic hypotension. If severe myelosuppression occurs, consider testing for genetic metabolic abnormality.

**Contraindicated in:**
- Hypersensitivity
- OB, Lactation: Pregnancy or lactation
- Severe liver disease

**Genetic Implication:**
CAPI TALS indicate life-threatening, underlines indicate most frequent. Strikethrough indicates discontinued.
Monitor intake and output ratios and inform health care professional if significant discrepancies occur. Encourage fluid intake of 2000–3000 mL/day. All patients and allopurinol and alkalinization of the urine may be used to decrease serum uric acid levels and to help prevent urate stone formation.

Assess patient’s nutritional status. Anorexia and weight loss can be decreased by feeding light, frequent meals. Nausea and vomiting can be minimized by administering antinausea at 1 hr before receiving medication.

**Lab Test Considerations:** Monitor CBC and differential before and weekly during therapy. May cause leukopenia, thrombocytopenia, and anemia. Notify health care professional if a sudden drop in values occurs. Leukopenia and thrombocytopenia are usually mild, occur 5–6 days after initiation of therapy, and persist for approximately 7 days after discontinuation of therapy.

Monitor hepatic function (AST, ALT, alkaline phosphatase, LDH, and bilirubin) weekly during early therapy and monthly thereafter.

Monitor renal function (BUN, serum creatinine) and serum uric acid concentrations before and periodically during therapy. May cause uric acid.

Serum glucose and uric acid levels may show false when sequential multiple analyzer is used to determine values.

**Potential Nursing Diagnoses**

- Risk for infection (Adverse Reactions)
- Imbalanced nutrition: less than body requirements (Adverse Reactions)

**Implementation**

- **High Alert:** Fatalities have occurred with chemotherapeutic agents. Before administration, clarify all ambiguous orders; double check single, daily, and course of therapy dose limits. Have second practitioner independently double check original order and dose calculations.

- Do not confuse with Pentostatin (mercaptopurine) with propylthiouracil.

- The dose of mercaptopurine should be reduced to 1/3–1/4 the usual dose in patients on concomitant chemotherapy.

- PO: Administer medication with meals. Tablets may be crushed if patient has difficulty swallowing.

**Patient/Family Teaching**

- Instruct patient to take medication as directed. If a dose is missed, it should be omitted.

- Instruct patient to notify health care professional promptly if fever, chills, cough, headache, signs of infection, lower back or side pain, nausea or vomiting, increased fatigue, dysuria, or urate stone formation occurs. Caution patient to avoid crowds and persons with known infections. Instruct patient to use soft toothbrush and electric razor and to avoid takeoffs. Caution patient not to drink alcoholic beverages or take medications containing aspirin or NSAIDS; may precipitate gouty arthritis.

- Instruct patient to report yellowing of anorexia, diarrhea, jaundice, ascites, skin or eyes, dark-colored urine, clay-colored stools, abdominal pain, flank or joint pain, or swelling of feet or legs to health care professional promptly.

- Advise patient that this medication may have teratogenic effects. Contraception should be used by both men and women during therapy and for at least 4 mo after conclusion of therapy.

- Instruct patient not to receive any vaccinations without advice of health care professional.

- Emphasize the need for periodic lab tests to monitor for side effects.

**Evaluation/Desired Outcomes**

- Remission of acute leukemia. Patients may receive subsequent doses if hematologic profiles are within normal ranges and patients do not demonstrate serious side effects.

*Why was this drug prescribed for your patient?*