minoxidil (systemic) (mi-nox-i-dill)

**Classification**
- Therapeutic: antihypertensives
- Pharmacologic: vasodilators

**Pregnancy Category C**

**Indications**
Severe symptomatic hypertension or hypertension associated with end-organ damage that has failed to respond to combinations of more conventional therapy.

**Action**
Directly relaxes vascular smooth muscle, probably by inhibiting the enzyme phosphodiesterase. Results in vasodilation, which is more pronounced in arterioles than veins. Therapeutic Effects: Lowering of BP.

**Pharmacokinetics**
- **Absorption:** Well absorbed following oral administration.
- **Distribution:** Widely distributed, enters breast milk.
- **Metabolism and Excretion:** 90% metabolized by the liver.
- **Half-life:** 4.2 hr.

**TIME/ACTION PROFILE (antihypertensive effect)**
- **ROUTE:** ONSET: PEAK: DURATION
- **PO** 30 min 2–3 hr 2–5 days

**Contraindications/Precautions**
- **Contraindicated in:** Hypersensitivity; Pheochromocytoma.
- **Use Cautiously in:** Recent MI; Severe renal impairment (can be used in moderate renal impairment); Geri: May be more sensitive to effects; consider age-related decrease in body mass and hepatic/renal/cardiovascular function; OB, Lactation: Safety not established.

**Adverse Reactions/Side Effects**
- **CNS:** headache.
- **Resp:** PULMONARY EDEMA.
- **CV:** HF, ECG changes (alteration in T waves), tachycardia, angina, pericardial effusion.
- **GI:** nausea.
- **Derm:** hypertrichosis, pigment changes, rash.
- **Endo:** gynecomastia, menstrual irregularities.
- **F & E:** sodium and water retention. Miscellaneous: classification.

**Interactions**
- **Drug-Drug:** additive hypotensive effects with other antihypertensives, acute ingestion of alcohol, or nitrates. NSAIDs may reduce antihypertensive effectiveness of minoxidil.

**Route/Dosage**
- **PO (Adults and Children ≥12 yr):** Hypertension—5 mg once daily or in 2 divided doses; may double at 3-day intervals; usual range 10–40 mg/day (for rapid control with careful monitoring, dose may be adjusted q 6 hr; up to 100 mg/day has been used).
- **PO (Children ≤12 yr):** Hypertension—0.2 mg/kg/day (5 mg maximum) as a single dose or 2 divided doses; may be gradually increased in increments of 50–100% until response is obtained; usual range 0.25–1 mg/kg/day (for rapid control, dose may be adjusted q 6 hr; not to exceed 50 mg/day).

**NURSING IMPLICATIONS**

**Assessment**
- **Hypertension:** Monitor BP and pulse frequently during initial dose adjustment and periodically during therapy. Report significant changes.
- **Monitor frequency of prescription refills to determine adherence.**
- **Monitor intake and output ratios and daily weight and assess for edema daily, especially at beginning of therapy. Report weight gain or edema; sodium and water retention may be treated with diuretics.
- **Lab Test Considerations:** Monitor renal and hepatic function, CBC, and electrolytes prior to and periodically during therapy.
- **May cause:** BUN, serum creatinine, alkaline phosphatase, plasma renin activity (PRA), and sodium levels. May also cause: Hb, hematocrit, and hematocrit counts. Hematologic and renal values usually return to pretreatment levels with continued therapy.

**Potential Nursing Diagnoses**
- Ineffective tissue perfusion (indications)

**Implementation**
- **PO:** Do not confuse Loniten (minoxidil) with Lipitor (atorvastatin). **Hypertension:** Medication may need to be discontinued gradually to prevent rebound hypertension.
- **Measure dose accurately.**
- **Administer 25% of the total daily dose at bedtime to avoid dizziness or fainting.**

**NURSING CONSIDERATIONS**

- **Cardiovascular:**
- **Respiratory:**
- **Skin:**
- **Gastrointestinal:**
- **Psychological:**
- **Other:**

**Discontinue**
Minoxidil is given concurrently with a diuretic unless patient is on hemodialysis.

- Dose adjustments should not be made more frequently than every 3 days to allow for maximum effectiveness, unless rapid control is necessary.
- PO: May be administered without regard to meals or food.

**Patient/Family Teaching**

- Emphasize the importance of continuing to take this medication, even if feeling well. Instruct patient to take medication at the same time each day. Take missed doses as soon as remembered if within a few hours; otherwise, omit dose and return to regular dose schedule. Do not double doses. Advise patient not to discontinue minoxidil or other antihypertensive medications without consulting health care professional. Minoxidil helps control but does not cure hypertension.
- Encourage patient to comply with additional interventions for hypertension (weight reduction, low-sodium diet, smoking cessation, moderation of alcohol consumption, regular exercise, and stress management).
- Instruct patient and family on proper technique for weekly pulse and BP monitoring. Advise them to report significant changes to health care professional, who should also be notified if resting pulse increases more than 20 bpm above baseline.
- Advise patient to check weight daily and to notify health care professional of rapid weight gain of ≥ 5 lb or if signs of fluid retention occur.
- Caution patient to change positions slowly to minimize orthostatic hypotension.
- Advise patient to notify health care professional of all Rx or OTC medications, vitamins, or herbal products being taken and to consult with health care professional before taking other medications, especially cough, cold, or allergy remedies or herbal products.
- Inform patient that depilatory creams may minimize increased hair growth. This is temporary and is reversible within 1–6 mo following discontinuation of minoxidil.
- Advise patient in notify health care professional of unusual swelling of face, extremities, or abdomen; difficulty breathing, especially when lying down; new or aggravated angina; severe indigestion; dizziness or fainting occurs.

**Evaluation/Desired Outcomes**

- Decrease in BP without appearance of serious side effects.

*Why was this drug prescribed for your patient?*