**Simvastatin**

**Classification**
Therapeutic: lipid-lowering agents
Pharmacologic: HMG-CoA reductase inhibitors (statin)

**Pregnancy Category X**

**Indications**
Adjuvant management of primary hypercholesterolemia and mixed dyslipidemias.

**Action**
Inhibits 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase, an enzyme which is responsible for catalyzing an early step in the synthesis of cholesterol. Therapeutic Effects: lowering of total and LDL cholesterol and triglycerides. Slightly increases HDL cholesterol. Slows the progression of coronary atherosclerosis with resultant decrease in coronary heart disease-related events.

**Pharmacokinetics**
Absorption: 85% absorbed, but rapidly metabolized.
Distribution: Unknown.
Protein Binding: 95%.
Metabolism and Excretion: Extensively metabolized by the liver, most during first pass, excreted in bile and feces; 13% excreted unchanged by the kidneys.
Half-life: Unknown.

**TIME/ACTION PROFILE (cholesterol-lowering effect)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>2 wk</td>
<td></td>
<td>1 mo</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**
Contraindicated in: Hypersensitivity; Concurrent use of strong CYP3A4 inhibitors; nicotinic acid, lovastatin, atorvastatin, cerivastatin, rosvastatin, ezetimibe; pregnancy; breastfeeding; children < 10 yr (safety not established).

**Adverse Reactions/Side Effects**
CNS: amnesia, confusion, dizziness, headache, insomnia, memory loss, weakness.
GI: abdominal cramps, constipation, diarrhea, indigestion, nausea, pancreatitis.
GU: erectile dysfunction.
Derm: rashes, pruritus.
Endo: hyperglycemia.
MS: rhombomyllosis, arthralgia, immune-mediated necrotizing myopathy, myopathy (risk with 80 mg dose).
Misc: hypersensitivity reactions.

**Interactions**
Drug Drug: Risk of myopathy and rhabdomyolysis are significantly increased with concurrent use of cyclosporine, gemfibrozil, rosiglitazone, telithromycin, protease inhibitors, azole antifungals, clarithromycin, ketoconazole, itraconazole, voriconazole, posaconazole; concurrent use contraindicated. Cholesterol-lowering effect may be reduced by bile acid sequestrants (cholestyramine, colestipol). Bioavailability may be reduced by bile acid sequestrants; risk of myopathy is increased by concurrent use of amiodarone, amlopidine, diltiazem, dronedarone, verapamil, ranolazine, lomitapide, or niacin. May slightly increase serum digoxin levels. May increase risk of bleeding with warfarin.

Drug-Food: Risk of myopathy and rhabdomyolysis are significantly increased with concurrent use of grapefruit juice.

**Route/Dosage**
The 80 mg dose should be restricted to patients who have been taking this dose for ≥ 12 mo without evidence of muscle toxicity.

**PO (Adults):** 5–40 mg once daily in the evening; if LDL goal cannot be achieved with 40 mg daily dose, add another lipid-lowering therapy (do not increase simvastatin dose to 80 mg).

**Adverse Events:** Common (≥ 1%): Headache, dizziness, abdominal pain, flatulence, diarrhea, nausea, muscle cramps, myalgia, fatigue. Uncommon (< 1%): Loss of appetite, arthralgia, rash, pruritus, dyspepsia, abdominal pain, indigestion, diarrhea, constipation, nausea, vomiting, flatulence, headache, dizziness, weakness, fatigue, dry mouth, xerostomia, diarrhea, anorexia, flatulence, eructation, muscle spasm, pain, tenderness, myalgia, hypertension, hyperglycemia. Rare: Myopathy, rhabdomyolysis. **Discontinue.**
mg/day). Concurrent verapamil, diltiazem, or dronedarone therapy—Dose should not exceed 10 mg/day. Concurrent amiodarone, verapamil, or diltiazem therapy—Dosage should not exceed 20 mg/day. Concurrent lomitapide therapy—Dose should be reduced by 50% (dose should not exceed 20 mg/day or 40 mg/day for patients who previously received 80 mg/day chronically for ≤12 mo without evidence of myopathy).

PO (Children ≥10 yr): 10 mg/day initially, may be increased at 4 wk intervals up to 40 mg/day. Concurrent amiodarone, verapamil, or diltiazem therapy—Dose should not exceed 10 mg/day. Concurrent verapamil or diltiazem therapy—Dose should not exceed 10 mg/day.

Renal Impairment

PO (Adults): CCr <30 mL/min—5 mg/day initially; titrate carefully.

NURSING IMPLICATIONS

Assessment

- Obtain a diet history, especially with regard to fat consumption.
- Lab Test Considerations: Evaluate serum cholesterol and triglyceride levels before initiating, after 4–6 wk of therapy, and periodically thereafter.

- Monitor liver function tests prior to initiation of therapy and as clinically indicated. If symptoms of serious liver injury, hepatitis, jaundice, or jaundice occurs, discontinue simvastatin and bilirubin levels.

- If patient develops muscular tenderness during therapy, CPK levels should be monitored. If CPK levels are markedly ↑ or myopathy occurs, therapy should be discontinued.

Potential Nursing Diagnoses

- Noncompliance (Patient/Family Teaching)

Implementation

- PO: Administer once daily in the evening. May be administered without regard to food.
- Avoid grapefruit and grapefruit juice during therapy; may increase risk of toxicity.

Patient/Family Teaching

- Instruct patient to take medication as directed, notice signs or symptoms of myopathy, especially if accompanied by fever or malaise. If patient develops muscle tenderness during therapy, should be discontinued.

- Advise patient to wear sunscreen and protective clothing to prevent photosensitivity reactions (rare).

- Instruct patient to notify health care professional if unexplained muscle pain, tenderness, or weakness occurs, especially if accompanied by fever or malaise.

- Advise patient to notify health care professional promptly if pregnancy is planned or suspected, or if breast feeding.

- Instruct patient to notify health care professional of all Rx or OTC medications, vitamins, or herbal products being taken and consult health care professional before taking any new medications.

- Advise patient to notify health care professional if alcohol consumption increases or if the patient drinks more than 1 qt of grapefruit juice/day during therapy.

- Medication helps control but does not cure elevated serum cholesterol levels.

- Advise patient that this medication should be used in conjunction with diet restrictions (fat, cholesterol, carbohydrates, alcohol), exercise, and cessation of smoking.

- Instruct patient to notify health care professional if unexplained muscle pain, tenderness, or weakness occurs, especially if accompanied by fever or malaise.

- Advise patient to notify health care professional of all Rx or OTC medications, vitamins, or herbal products being taken and consult health care professional before taking any new medications.

- Advise patient to notify health care professional of medication regimen before treatment or surgery.

- Instruct female patients to notify health care professional promptly if pregnancy is planned or suspected, or if breast feeding.

- Emphasize the importance of follow-up exams to determine effectiveness and to monitor for side effects.

Evaluation/Desired Outcomes

- Decrease in LDL and total cholesterol levels.
- Increase in HDL cholesterol levels.
- Decrease in triglyceride levels.
- Slowing of the progression of coronary artery disease.

Why was this drug prescribed for your patient?