**DESCRIPTION**

**QUESTRAN** (Cholestyramine for Oral Suspension USP), the cholestyramine salt of a basic anion exchange resin, is a cholesteryl-removing agent, intended for oral administration. Cholestyramine resin is quite hydrophilic, but insoluble in water. The cholestyramine resin in QUESTRAN is not absorbed from the digestive tract. Four grams of anhydrous cholestyramine resin is contained in 5 grams of QUESTRAN LIGHT. It is represented by the following structural formula:

\[
\text{[CH}_2\text{N}^+\text{(CH}_3\text{)}_3\text{Cl]}_n\quad \text{[Cholestyramine for Oral Suspension USP]}
\]

**QUESTRAN** powder contains the following inactive ingredients: acacia, citric acid, D&C Yellow No. 10, FD&C Yellow No. 6, flavor (frankfurter and artificial french), propylene glycol, propylene glycol palmitate and sucrose gum. **QUESTRAN LIGHT** contains the following inactive ingredients: acacia, citric acid, citric acid, colloidal silicon dioxide, D&C Yellow No. 10, FD&C Red No. 6, flavor (natural and artificial orange), maltodextrin, propylene glycol alginate and xanthan gum.

**ACTIONS/CLINICAL PHARMACOLOGY**

Cholestyramine is probably the sole precursor of bile acids. During normal digestion, bile acids are cleaved into intermediates. A major portion of the bile acids is absorbed from the intestinal tract and returned to the liver via the enterohepatic circulation. Only very small amounts of bile acids are found in normal serum.

Cholestyramine resin combines with the bile acids in the intestine to form an insoluble complex which is excreted in the feces. This results in a partial removal of bile acids from the enterohepatic circulation by preventing their absorption. The increased fecal loss of bile acids due to QUESTRAN administration leads to an increased production of cholesterol in the liver, a decrease in bile formation or secretory rate by hepatocytes in plasma levels and a decrease in serum cholesterol levels. In addition, QUESTRAN decreases the size of existing atheromatous lesions in the coronary arteries of patients with coronary artery disease.

**INDICATIONS AND USAGE**

1. QUESTRAN (Cholestyramine for Oral Suspension USP) is indicated as adjunctive therapy to diet for the reduction of elevated serum cholesterol in patients with primary hypercholesterolemia (elevated low density lipoprotein [LDL] cholesterol) who do not respond adequately to diet alone. QUESTRAN LIGHT contains 0.08 g cholestyramine and QUESTRAN FOR THE OBESOE contains 0.12 g cholestyramine. The resin is neutralized in patients who also have hypertriglyceridemia, but it is not indicated where hypertriglyceridemia is the only abnormality.

2. QUESTRAN LIGHT contains 0.08 g cholestyramine and QUESTRAN FOR THE OBESOE contains 0.12 g cholestyramine. The resin is neutralized in patients who also have hypertriglyceridemia, but it is not indicated where hypertriglyceridemia is the only abnormality.

**INDICATIONS AND USAGE**

Questran therapy should be continued during and after drug therapy specific for the type of hyperlipidemia determined prior to initiation of drug therapy. Excess body weight may be an important factor and caloric restriction for weight normalization should be addressed prior to drug therapy in the overweight.

Prior to initiating therapy with QUESTRAN in patients with significant cardiovascular causes of hyperlipidemia (e.g., poorly controlled diabetes mellitus, hyperthyroidism, nephrotic syndrome, dysproteinemias), concomitant oral medication such as phenylbutazone, warfarin, thiazide diuretics (acidic), or phenobarbital should be excluded, and a lipid profile performed to assess total cholesterol, HDL-C, and triglycerides (TG). For individuals with TG levels >400 mg/dL, (<6.6 mmol/L), HDL-C should be estimated using the following equation:

\[
\text{LDL-C} = \text{Total cholesterol} - \left( \text{TG} \times \frac{5}{2} \right) - \left( \text{HDL-C} \times \frac{2}{3} \right)
\]

For TG levels >400 mg/dL, this equation is less accurate and LDL-C concentrations should be determined by ultracentrifugation. In hypertriglyceridemic patients, LDL-C may be too low or non-existent. Elevated serum cholesteryl and triglyceride levels should be determined periodically based on MCH guidelines to confirm initial adequate lipoprotein response. A favorable trend in cholesterol reduction should occur during the first month of QUESTRAN therapy. The therapy should be continued to sustain cholesterol reduction if adequate cholesterol reduction is not attained. Increasing the dosage of QUESTRAN or adding other lipid-lowering agents in combination with QUESTRAN should be considered.

Since the goal of treatment is to lower LDL-C, the NCEP recommends that LDL-C levels be used to titrate and assess treatment response. If LDL-C levels are not available or cannot be used to monitor long-term therapy, a lipoprotein analysis (including LDL-C determination) should be carried out once or twice. The NCEP treatment guidelines are summarized below.

**CONTRAINDICATIONS**

QUESTRAN is contraindicated in patients with complete biliary obstruction where bile is not secreted into the intestine and in those individuals who have shown hypersensitivity to any of its components.

**WARNINGS**

**PHENYLETHANOLAMINE SOURCE: QUESTRAN LIGHT CONTAINS 14.0 mg PHENYLETHANOLAMINE PER 9 GRAM DOSE.**

**PRECAUTIONS**

**General**

Chronic use of QUESTRAN may be associated with increased bleeding tendency due to hypofibrinogenemia associated with Vitamin K deficiency. This will usually require prompt therapy with parenteral Vitamin K and reassurance can be provided by oral administration of Vitamin K. Reduction of serum or red cell folate has been reported over long term administration of QUESTRAN. Supplementation with folate should be considered in these cases. There is a possibility that prolonged use of QUESTRAN is a chronic form of anion exchange resin, may produce hyperfibrinogenemia. This would be especially true in younger and smaller patients where the relative dosage may be higher. Caution should also be exercised in patients with renal insufficiency or volume depletion, and in patients receiving concurrent anticoagulants.

QUESTRAN may produce or worsen pre-existing constipation. The dosage should be increased gradually in patients to minimize the risk of developing faecal impaction. In patients with pre-existing constipation, the starting dose should be 1 packet or 1 caplet once daily for 5 to 7 days, increasing in twice daily with monitoring of constipation and of serum lipoproteins, at times, twice to 4 weeks apart. Increased fluid intake and fiber intake should be encouraged to alleviate constipation and a stool softer may be occasionally be indicated. If the incidence of constipation has increased as noted by one or more (monthly intervals) with periodic monitoring of serum lipoproteins. If constipation persists or the desired therapeutic response is not achieved at any 6 days, combination therapy or alternate therapy should be considered. Particular effort should be made to avoid QUESTRAN in patients with symptomatic coronary artery disease. Concomitance associated with QUESTRAN may aggravate hemorhoids.

**Information to Patients**

Inform your physician if you are pregnant or plan to become pregnant or are breastfeeding. Drink plenty of fluids and mix each 9 gram dose of QUESTRAN Powder in at least 2 to 6 ounces of fluid before taking. Sipping or holding the resin suspension in the mouth for prolonged periods may be indicated. If QUESTRAN Light is used, it should be mixed in at least 2 to 6 ounces of fluid before taking. Sipping or holding the resin suspension in the mouth for prolonged periods may be indicated. If QUESTRAN Powder is used, the suspension may be taken with or without meals.

**Lactation Test**

Serum cholesterol levels should be determined immediately after the first few months of therapy and periodically thereafter. Serum triglyceride levels should be measured periodically to detect whether significant changes have occurred.

**Laboratory Tests**

Serum cholesterol levels should be determined after the first few months of therapy and periodically thereafter. Serum triglyceride levels should be measured periodically to detect whether significant changes have occurred.

**Drug Interactions**

The cholestyramine resin and QUESTRAN should be taken at least 2 hours before or after calcium, iron, magnesium, and zinc salts. The resin should adsorb the following drugs and may prevent adsorption of other medications:

- Oral contraceptives
- Digitalis glycosides
- Oral anticoagulants
- Salicylates
- Antibiotics

**Conversion of Serum Cholesterol and Triglycerides**

**Cholesterol Conversion Formula**

\[
\text{Cholesterol (mg/dL)} = \text{Cholesterol (mmol/L)} 	imes 38.6
\]

**Triglycerides Conversion Formula**

\[
\text{Triglycerides (mg/dL)} = \text{Triglycerides (mmol/L)} 	imes 88.6
\]

**LDL-C Conversion Formula**

\[
\text{LDL-C (mg/dL)} = \text{LDL-C (mmol/L)} 	imes 38.6
\]

**HDL-C Conversion Formula**

\[
\text{HDL-C (mg/dL)} = \text{HDL-C (mmol/L)} 	imes 38.6
\]

**Triglycerides Conversion Formula**

\[
\text{Triglycerides (mg/dL)} = \text{Triglycerides (mmol/L)} 	imes 88.6
\]

**LDL-C Conversion Formula**

\[
\text{LDL-C (mg/dL)} = \text{LDL-C (mmol/L)} 	imes 38.6
\]

**HDL-C Conversion Formula**

\[
\text{HDL-C (mg/dL)} = \text{HDL-C (mmol/L)} 	imes 38.6
\]
DOSAGE AND ADMINISTRATION

The recommended starting adult dose for all QUESTRAN powdered products (QUESTRAN Powder and QUESTRAN LIGHT) is one packet or one level scoopful once or twice a day. The recommended maintenance dose for all QUESTRAN powdered products is 2 to 4 packets or scoopfuls daily (8 to 16 grams anhydrous cholestyramine resin) divided into two doses. Four grams of anhydrous cholestyramine resin is contained in each measured dose of QUESTRAN as follows:

QUESTRAN Powder 9 grams QUESTRAN LIGHT 5 grams

It is recommended that doses be institutionalized and/or adjusted on a weight basis according to the body weight of the patient being treated. The suggested usual adult daily dose is six packets or scoopfuls of QUESTRAN (24 grams of anhydrous cholestyramine resin). The suggested usual dose is at bedtime but may be modified to avoid interference with the absorption of other medications. The recommended dosing schedule is twice daily. QUESTRAN may be administered in 1 to 6 doses per day.

QUESTRAN should not be taken in its dry form. Always mix QUESTRAN with water or other fluids before ingesting. See Preparation Instructions. Concomitant Therapy

Paroxysms of the colic may vary somewhat from batch to batch but this variation does not affect the performance of the product. Place the contents of one single-dose packet or one level scoopful of QUESTRAN in a glass or cup. Add an amount of water or other non-carbonated beverage of your choice depending on the product being used:

QUESTRAN LIGHT 2 to 6 ounces per dose
QUESTRAN 5 grams 6 packets

Stir to a uniform consistency and drink. QUESTRAN may be mixed with lightly fluid soaps or popsicle fruits with a high moisture content such as applesauce or cranberry juice.

HOW SUPPLIED

QUESTRAN Powder (Cholestyramine for Oral Suspension) is a yellow colored orange flavored powder available in cans containing 37.8 grams and in containers of sixty 0.5 gram packets. Four grams of anhydrous cholestyramine resin are contained in 8 grams of QUESTRAN Powder. The 37.3 g can includes a 15 cc scoop. The scoop is not interchangeable with scoops from other products.

NDC 49884-506-66 Can, 37.8 g NDC 49884-506-65 Can, 60.9 packets

QUESTRAN LIGHT (Cholestyramine oral Suspension USP) is a cream to pale yellow colored orange flavored powder available in cans containing 210 grams. Four grams of anhydrous cholestyramine resin are contained in 5 grams of QUESTRAN LIGHT. The 210 g can includes a 80 cc scoop. The scoop is not interchangeable with scoops from other products. Made in India.*

NDC 49884-507-67 Can, 210 g

Storage Store between 20° to 25°C (68° to 77°F). (See USP Controlled Room Temperature.) Excerpts permitted to 10° to 30°C (50° to 86°F).

*Registered trademark of Par Pharmaceutical, Inc.

REFERENCES

5. The Lipid Research Clinics Coronary Primary Prevention Trial: Results of 6 Years of Post-Trial Follow-Up. Arch Intern Med 1992;152:1399-
