



CARRIER SCREEN

What is Smith-Lemli-Opitz syndrome?

Smith-Lemli-Opitz syndrome (SLOS) is an inherited disease characterized by multiple birth defects and mental retardation. Symptoms of SLOS are attributed to the body's inability to produce cholesterol due to a deficiency of an enzyme called 7-dehydrocholesterol reductase (7-DHC). In pregnancy, cholesterol production is essential for normal development of a baby since it is a component of most cells and is used in the production of certain hormones and digestive acids.¹

What are the symptoms of Smith-Lemli-Opitz syndrome and what treatment is available?

Signs and symptoms of Smith-Lemli-Opitz syndrome range from mildly affected individuals with minor physical anomalies and behavioral and learning disabilities to severely affected individuals with life threatening birth defects and profound intellectual impairment. Mental retardation typically falls in the moderate to severe range.¹ Signs and symptoms of SLO may include:²

- Mental Retardation
- Microcephaly (small head)
- Extra fingers
- Webbing between the toes
- Congenital heart defects (defects in structure of heart present at birth)
- Cleft palate (hole in the roof of the mouth)
- Genital malformations
- Brain and kidney malformations
- Hypotonia (low muscle tone)
- Feeding problems
- Prenatal and postnatal growth retardation
- Cataracts
- Hearing loss
- Sensitivity to sun light
- Behavioral problems may include hyperactivity, irritability, autistic spectrum behaviors, sleep disturbances, or self-injury
- Miscarriage or stillbirth of affected pregnancies³

There is no cure for SLOS. Surgical repair is available for some birth defects. Supplementation with cholesterol has been shown to improve growth and sensitivity to light; however it has not been shown to improve developmental and behavioral function.²

How is Smith-Lemli-Opitz syndrome inherited?

SLOS is an autosomal recessive disease caused by mutations in the *DHCR7* gene. An individual who inherits one copy of a *DHCR7* gene mutation is a "carrier" and is not expected to have related health problems. An individual who inherits two mutations in this gene, one from each parent, is expected to be affected with SLOS.

If both members of a couple are carriers, the risk for an affected child is 25% in each pregnancy. Therefore, it is especially important that the reproductive partner of a carrier be offered testing.



Who is at risk for Smith-Lemli-Opitz syndrome?

Smith-Lemli-Opitz has an estimated pregnancy incidence in the general population of 1/20,000 and carrier frequency of 1/71. SLO occurs most commonly in the Caucasian population and is less common in individuals of Asian or African ancestry.^{1,3}

What does a positive test result mean?

If a gene mutation is identified, an individual should speak to a physician or genetic health professional about the implications of the result and appropriate testing for the reproductive partner and at-risk family members.

What does a negative test result mean?

A negative result reduces, but does not eliminate, the possibility that an individual carries a gene mutation. The likelihood of being a carrier is also influenced by family history, medical symptoms, and other relevant test results.

Where can I get more information?

- The Smith-Lemli-Opitz | RSH Foundation: <http://www.smithlemliopitz.org>
- NIH Office of Rare Diseases Research - Genetic and Rare Diseases (GARD) Information Center www.rarediseases.info.nih.gov/GARD/
- National Organization for Rare Disorders: <http://www.rarediseases.org/rare-disease-information/rare-diseases/>.

References

1. Genetics Home Reference. Smith-Lemli-Opitz. <http://ghr.nlm.nih.gov/condition/smith-lemli-opitz-syndrome>. Accessed March 8, 2012
2. GeneReviews. Smith-Lemli-Opitz Syndrome. <http://www.ncbi.nlm.nih.gov/books/NBK1143/>. Accessed 01/04/2012
3. Craig W, et al. Identifying Smith-Lemli-Opitz syndrome in conjunction with prenatal screening for Down syndrome. *Prenatal Diagnosis* 2006; 26:842-849.

