



The University of Chicago Genetic Services Laboratories

5841 S. Maryland Ave., Rm. L035, MC 0077, Chicago, Illinois 60637
Toll Free: (888) UC GENES (888) 824 3637
Local: (773) 834 0555 FAX: (773) 834 0556
ucgslabs@genetics.uchicago.edu www.genes.uchicago.edu
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Genetic Testing for Sotos Syndrome

Information for Patients and Families

What is Sotos syndrome?

Sotos syndrome is a rare genetic condition. As with other syndromes, individuals with Sotos syndrome look alike. Common findings include: larger birth weight and fast growth with tall stature and larger head size (macrocephaly). Typical facial features include a prominent forehead, eyes that appear to slant down, long narrow face and a prominent jaw. Developmental delay in early childhood is common most likely because their bodies and head are bigger and their bodies are not strong enough yet to control movements like sitting and walking. Children will learn to walk, it just may happen later than other children their age. Learning problems vary greatly in people with Sotos syndrome. Some may only need extra help in school while others may not be able to live on their own as adults. Other frequent findings include an advanced bone age (the bones appear to be older than the child), feeding difficulties in infancy, heart and kidney defects, scoliosis and sometimes seizures.

While people with Sotos syndrome may have similar facial features, other findings are variable and differ from person to person. Some people may be mild and have few problems while others may be more severe.

What causes Sotos syndrome?

Sotos syndrome is caused by a mutation or change in the *NSD1* (Nuclear receptor SET-domain-containing protein 1) gene. We have two copies of the *NSD1* gene. Genes are written instructions to make proteins. Approximately 80% of the individuals with Sotos syndrome have a change in one copy of the *NSD1* gene. When there is a change in the instructions, the protein may not be made or may not work properly. Thus, the decreased amount of good protein from the *NSD1* gene causes the features in Sotos syndrome. Since not all people with Sotos syndrome will have a change that we can find in their *NSD1* gene, researchers are continuing to look for other causes of Sotos syndrome.

Can my child be tested? Can I be tested? Can my family members be tested?

The first person to be tested in any family should be the individual with Sotos syndrome. We use the analogy of reading a very long book (e.g. War and Peace) and looking for a single spelling error. You may read the whole book and miss the "typo," however when you do find it, then it is easy to test other family members (i.e. you know that the change is on page 875 in the second paragraph). So once a change is identified in the individual with Sotos syndrome, testing for other family members, even during a pregnancy, is easy and fast. Testing is available clinically at The University of Chicago Genetics Services Laboratory.

Testing for Sotos syndrome is done in two parts because there are two different types of changes that can occur in Sotos syndrome.

- Sequencing looks for a mistake in the gene sequence (a changed letter in the code). This includes reading the gene and looking for spelling mistakes. About 75% of patients with Sotos syndrome have this type of change.
- Deletion/duplication testing looks for a deletion or duplication of the whole *NSD1* gene or part of it. About 10% of patients with Sotos syndrome have this type of change.

Reasons for genetic testing for Sotos syndrome:

- confirm the diagnosis
- offer reassurance that other family members are not affected
- provide information and counseling for future pregnancies
- provide information during a pregnancy regarding possible Sotos syndrome in the child

What does it mean for my child if they find a mutation? What does it mean for our family?

Finding a mutation will confirm that your child has Sotos syndrome. Once a change is found in your child, then testing of other family members is easy, if they choose to be tested.

What does it mean for my child if they don't find a mutation?

Not finding a mutation does not mean that your child does not have Sotos syndrome. If your doctor feels that Sotos syndrome is doubtful, a negative result may lean against it. However, we are only able to find mutations in about 85% of people with Sotos syndrome at this time. Research is needed to improve testing.

What does it mean for my child if they find a variant of unknown significance?

A small number of patients will be found to have a change in the gene, but we are not sure whether that change causes Sotos syndrome or not. If this happens, we suggest testing parents. If a parent is found to have the same change (and does not have Sotos syndrome), then most likely this change is just a normal variant in the family. If it is not found in a parent, it is more likely to be the cause of Sotos syndrome.

How do I get my child tested?

We suggest that a geneticist or genetic counselor be involved in helping you order the test for your child. If you suspect that your child has Sotos syndrome, you should arrange for an appointment in a Genetics Clinic. Your doctor, hospital, or medical center can help with this. A genetics doctor can order the testing for Sotos syndrome. If there are any questions about ordering the testing, please ask the doctor or genetic counselor to contact The University of Chicago Genetics Services Laboratory. A blood sample is required for testing.

How much does the testing cost and will my child's health insurance cover it?

The cost for sequencing is \$2400, and the cost for deletion/duplication testing is \$350. All insurance companies are different, but most of them should cover at least part of the cost of testing. We recommend that you contact your insurance company to learn more about your specific coverage prior to testing. You will want to ask your insurance company what your coverage is for the following CPT (Current Procedural Terminology) codes:

- Sequencing: 83891, 83898 x 9, 83904 x 9, 83912
- Deletion/duplication testing: 83891, 83900, 83912

Insurance companies use these codes to define the method of testing. Most of the time, The University of Chicago will bill your hospital or laboratory, who will then bill your insurance company. In some situations, The University of Chicago cannot bill your hospital or lab. We can bill your insurance company for the deletion test. You may receive a bill for any amount not covered by your insurance company. We cannot bill insurance for the mutation testing. In this case, we will need payment from you by check or credit card before starting testing. You will need to seek payment from your insurance company; The University of Chicago is not responsible for this.

If a mutation or variant of unknown significance is detected in your child, cost for testing other family members is \$390 and prenatal testing is \$550-590. Contact The University of Chicago Genetic Services Laboratories for specific CPT codes.

When/how will I get the results?

The sequencing test takes approximately 10 weeks, and the deletion/duplication test takes approximately 4 weeks. Your doctor will receive the results by fax and mail as soon as it is finished.

Additional Resources:

Sotos Syndrome Support Association

Phone: 888-246-7772

P.O. Box 4626

Wheaton, IL 60189

Email: sssa@sotossyndrome.org

Website: www.sotossyndrome.org

Laboratory Faculty and Staff:

Soma Das, Ph.D.

Director, Molecular Genetics Laboratory

ABMG Certified Molecular Geneticist

William B. Dobyns, M.D. and Darrel J. Waggoner, M.D.

Clinical Advisors

ABMG Certified Clinical Geneticists

Stuart Schwartz, Ph.D.

Director, Cytogenetics Laboratory

ABMG Certified Cytogeneticist

Melissa Dempsey, M.S.

Certified Genetic Counselor