



# Sickle cell disease and hemoglobin S

“My daughter has hemoglobin S and has sickle cell disease. My niece has hemoglobin S and just has sickle cell trait. There is just so much to learn all at once. I asked my sister to go to the doctor with me. We made a list of questions together. I need to learn all I can so I can help my child cope with sickle cell disease.”

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## Hemoglobin is found in red blood cells

Hemoglobin brings oxygen from the lungs to other parts of the body. There are different types of hemoglobin.

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## Healthy people have mostly hemoglobin A in their red blood cells

This type of hemoglobin is normal. It keeps red blood cells soft, round, and smooth. These cells can pass easily through the tubes (vessels) that deliver blood around the body. Healthy red blood cells live for about 120 days.

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## People with sickle cell disease have mostly hemoglobin S in their red blood cells

This type of hemoglobin is abnormal. It causes red blood cells to be hard, pointed, and sticky—often shaped like a sickle. These cells have a hard time passing through tiny blood vessels and may get stuck. Sickle cells break up easily and live for only about 10 to 16 days. This causes anemia.

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## Hemoglobin S can be passed down through the genes

Genes are like a set of instructions for how the body is made and how it works. You get about half your genes from your mother and about half from your father. Eye color genes controlled the color of eyes you were born with. Hemoglobin genes tell the body what types of hemoglobin to make.



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## Some children with hemoglobin S get sickle cell trait

**Sickle cell trait (AS)** occurs when a child gets the normal hemoglobin gene (A) from one parent and the sickle cell gene (S) from the other. People with sickle cell trait will not get sickle cell disease. But two people who have sickle cell trait could have a baby with sickle cell disease.

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## Some children with hemoglobin S get sickle cell disease

There are several types of sickle cell disease (SCD for short). Here are the most common types:

- **SCD-SS** occurs when a child gets the sickle cell gene (S) from **both** parents. This is the most severe form of sickle cell disease.
- **SCD-SC** occurs when a child gets the sickle cell gene (S) from one parent and another abnormal gene (C) from the other.
- **Hemoglobin S beta thalassemia** occurs when a child gets the sickle cell gene (S) from one parent and another abnormal gene (**beta thalassemia**—either **zero** or **plus**) from the other.

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## Sickle cell disease causes health problems

When sickle cells block blood vessels, less blood can reach that part of the body. This can cause organ damage, severe pain, and other health problems. Sickle cells also cause anemia (low hemoglobin and red cell count).

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## How can I learn more about sickle cell trait and sickle cell disease?

- Contact the SCDA (Sickle Cell Disease Association of America) at 800-421-8453. Or, go to our website: [www.sicklecelldisease.org](http://www.sicklecelldisease.org)

