Nationwide Children's
When your child needs a hospital, everything matters.

Helping Hand™ Health Education for Patients and Families

Sickle Cell Trait (SCT)

A trait is something unique about you, like your hair or eye color. Traits are passed down (inherited) from your parents. Genes carry information that makes a trait. People with sickle cell trait (SCT) have 1 sickle cell gene and 1 normal gene.

- Having sickle cell trait is **not** the same as having sickle cell disease (SCD).
- Sickle cell trait means you could pass sickle cell trait or disease to your children.
- People with sickle cell trait live a normal life. They usually don't have symptoms of sickle cell disease.
- People of any race or background can have sickle cell trait; however, it occurs in 1 out of every 12 African Americans.

Passing on Sickle Cell Trait or Sickle Cell Disease

- If you inherit **1 sickle cell gene (S)** and **1 normal, non-sickle gene (A)**, then you have sickle cell trait. You are a carrier for sickle cell disease.
- It's important to know if your partner has sickle cell trait or disease. If they have either one, a child you have together could have sickle cell disease (Picture 1).

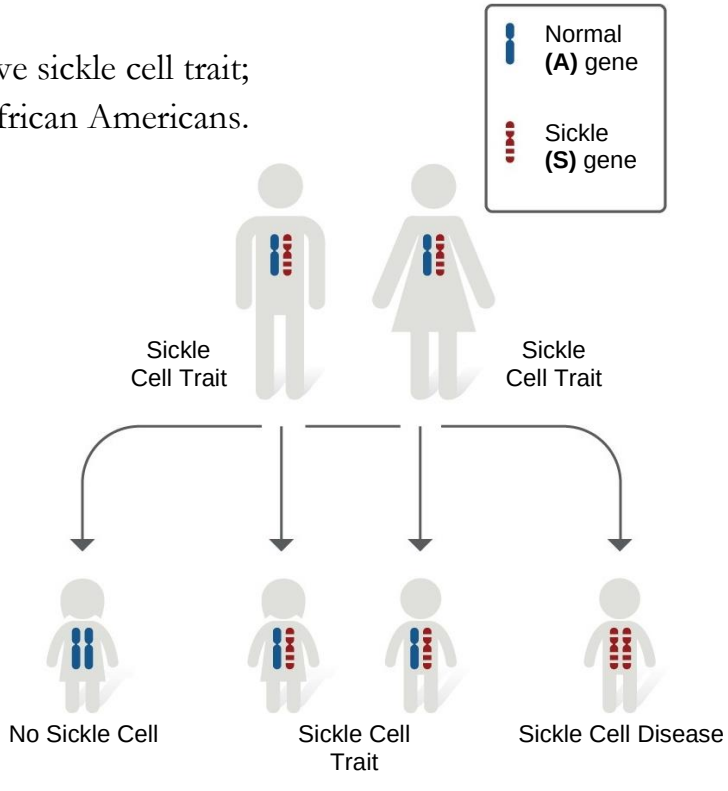

Image source: National Institute of Health, National Heart, Lung, and Blood Institute

Picture 1: Chance of parents with SCT passing on to their children.

Continued…

- If you and your partner both have sickle cell trait, your child could have:

AA	– 25% chance of 2 normal genes with normal red blood cells.
AS	– 50% chance of 1 normal gene and 1 sickle gene. This is sickle cell trait. They will have a few sickled cells.
SS	– 25% chance of 2 sickle genes; this is sickle cell disease.

- If 1 parent with sickle cell trait and 1 parent with abnormal hemoglobin have a child, that child could also have sickle cell disease. This abnormal hemoglobin can include beta thalassemia, hemoglobin C, or hemoglobin E.
- In the US, all newborns are screened for sickle cell trait and disease.

Problems with Sickle Cell Trait

- Rarely, people with sickle cell trait can have similar symptoms as someone with sickle cell disease. This typically happens under extreme conditions, such as:
  - Are at a very high height (altitude).
  - Have low oxygen from extreme exercising. This could be something like military boot camp or training for an athletic event.
  - Don't have enough water in your body (severely dehydrated).
  - Go deep sea or scuba diving.

Sickle Cell Disease

- Sickle cell disease is caused by abnormal hemoglobin. Hemoglobin is part of our red blood cells that carry oxygen.
- It is a life-long blood disease.
- Normal red blood cells are smooth and round. Sickled red blood cells are hard, sticky, and shaped like a banana.
- Sickled cells have a hard time moving through small blood vessels because of their shape. They can pile up and clog vessels. When clogging happens, blood can't carry oxygen to certain body parts.

More Information

For more information about sickle cell trait, contact the Sickle Cell Comprehensive Clinic at Nationwide Children's Hospital at (614) 722-3250.

You can also visit: https://www.cdc.gov/ncbddd/sicklecell/toolkit.html