Hemoglobin C

What is hemoglobin?

Hemoglobin is a part of the red blood cell that picks up oxygen and takes it from the lungs to every part of the body.

- Healthy red blood cells are round like donuts. They are flexible and smooth. This helps the cells move easily through the blood vessels.
- Changes in hemoglobin can change the shape and health of red blood cells.

What is the difference between hemoglobin trait and hemoglobin disease?

Genes carry the information that decide your traits or features. Genes are passed down from parent to child.

- People with a hemoglobin trait only get an abnormal gene from one parent.
  - Most often, they have no symptoms.
  - They can pass the gene on to their children.
- People with hemoglobin disease get an abnormal gene from both parents.

What is hemoglobin C?

Hemoglobin C is:

- A blood variant that is passed down from parent to child, like hair color or eye color. Variants are forms of blood that are different from normal blood.
- Caused by a mutation, or change, in normal adult hemoglobin A.
- More common in people of African, Middle Eastern or Mediterranean descent.

There are different types of hemoglobin C patterns:

1. Hemoglobin C trait
2. Hemoglobin CC disease
3. Hemoglobin C/β thalassemia
4. Sickle C (SC) disease

See more details about each of these ways on the following pages.

Hemoglobin C, continued

1. Hemoglobin C trait

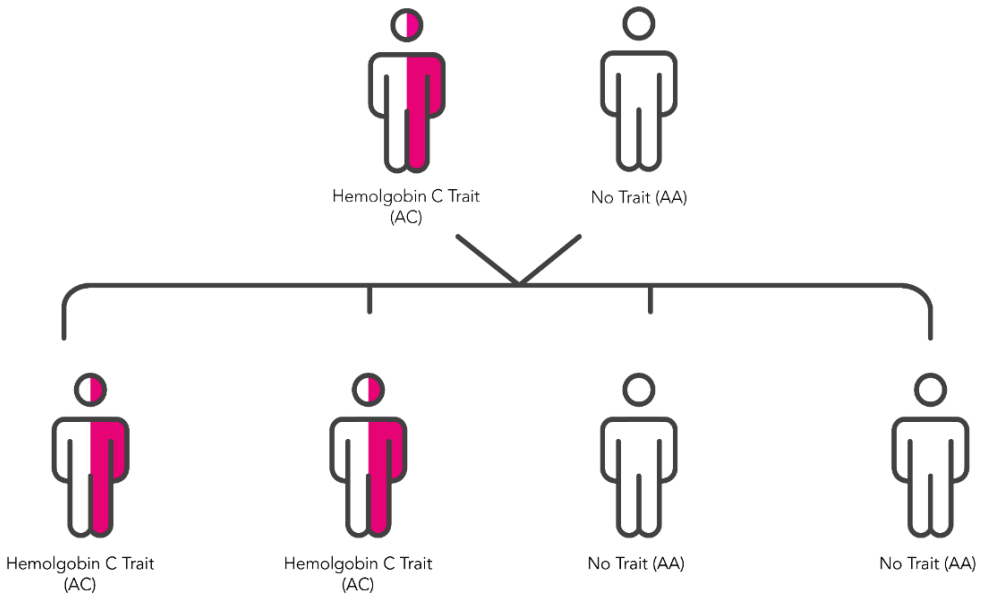
Hemoglobin C trait:

- Happens when a person inherits (gets) hemoglobin C from one parent and normal hemoglobin A from the other parent.
- Shows as FAC on a newborn screen. FAC means fetal hemoglobin plus normal hemoglobin A plus hemoglobin C.
- Does not cause anemia or other health problems. You may see low MCV (small cells) on a CBC (blood test called complete blood count).

Someone with hemoglobin C trait can have a child with sickle cell disease if their partner has sickle cell trait. Testing of partners for hemoglobin variants is advised when thinking about having children.

If one parent has hemoglobin C trait and the other parent has normal hemoglobin, there is a chance of having a child with hemoglobin C trait. **For each pregnancy**, there is a:

- 50% chance (1 in 2) of having a child with hemoglobin C trait
- 50% chance (1 in 2) of having a child without hemoglobin C trait



2. Hemoglobin CC disease

Hemoglobin CC disease:

- Happens when a person gets 2 genes for hemoglobin C (one from each parent). This causes the red blood cells to become less flexible.
- Most often shows as FC on a newborn screen. FC means fetal hemoglobin and C hemoglobin.

Young children will have a mild anemia. Anemia is when there are not enough healthy red blood cells.

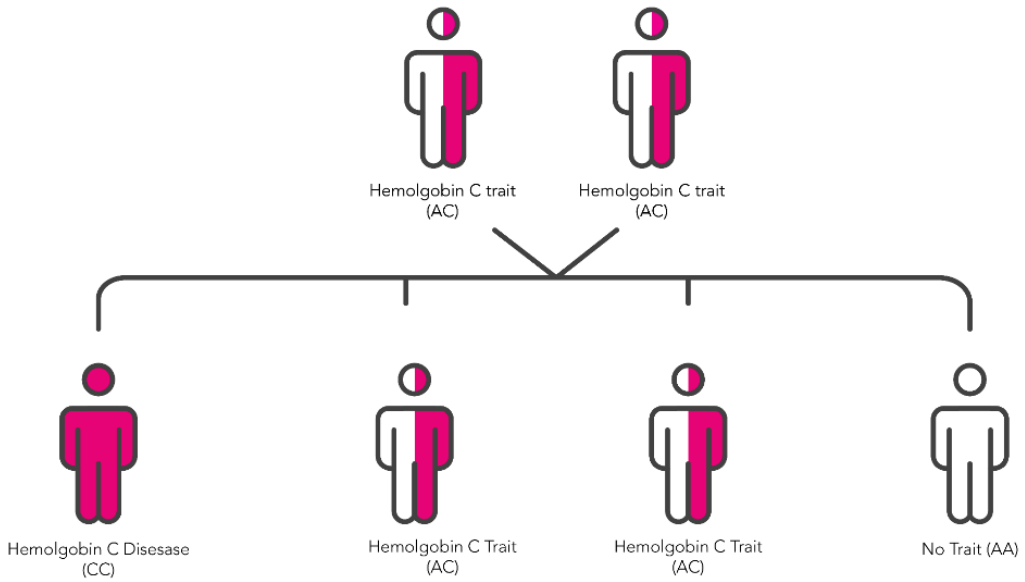
- Your baby is born with fetal hemoglobin.
- As he grows, fetal hemoglobin decreases and hemoglobin C increases.
- When this happens, your child will have a mild anemia.

Older children may have:

- Mild splenomegaly (spleen is bigger than normal)
- Jaundice (skin becomes yellow)
- Gallstones

If both parents have the hemoglobin C trait, there is a chance of having a child with hemoglobin CC disease. **For each pregnancy**, there is a:

- 25% (1 in 4) chance of having a child with hemoglobin CC disease
- 50% (1 in 2) chance of having a child with hemoglobin C trait
- 25% (1 in 4) chance of having a child without the trait or disease



In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.

3. Hemoglobin C/β thalassemia

Hemoglobin C/β thalassemia:

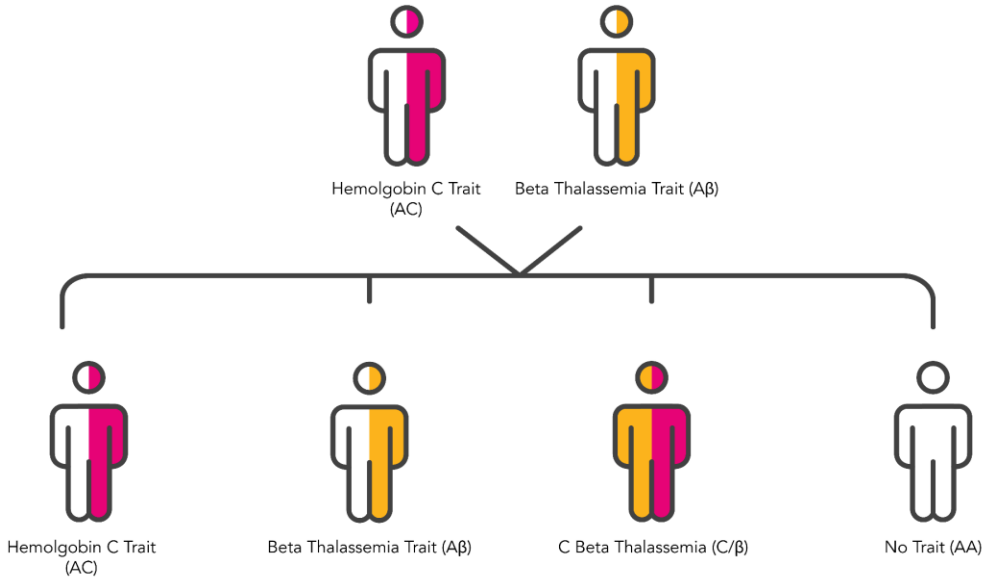
- Happens when a person gets hemoglobin C from one parent and β thalassemia (a different type of abnormal hemoglobin) from the other parent.
- Shows as FC or FCA on newborn screen.
  - FC means fetal hemoglobin and C hemoglobin.
  - FCA means fetal plus C plus normal adult (A) hemoglobin.
- Can cause mild to moderate anemia.

There are different types of hemoglobin C/β thalassemia and symptoms vary. Symptoms may include:

- Moderate anemia with splenomegaly (spleen is bigger than normal)
- Little to no anemia with small, target-shaped red blood cells

If one parent has the hemoglobin C trait and the other parent has β thalassemia, there is a chance of having a child with hemoglobin C/β thalassemia. **For each pregnancy**, there is a:

- 25% (1 in 4) chance of having a child with hemoglobin C trait
- 25% (1 in 4) chance of having a child with β thalassemia trait
- 25% (1 in 4) chance of having a child with hemoglobin C/β thalassemia
- 25% (1 in 4) chance of having a child with no trait or disease



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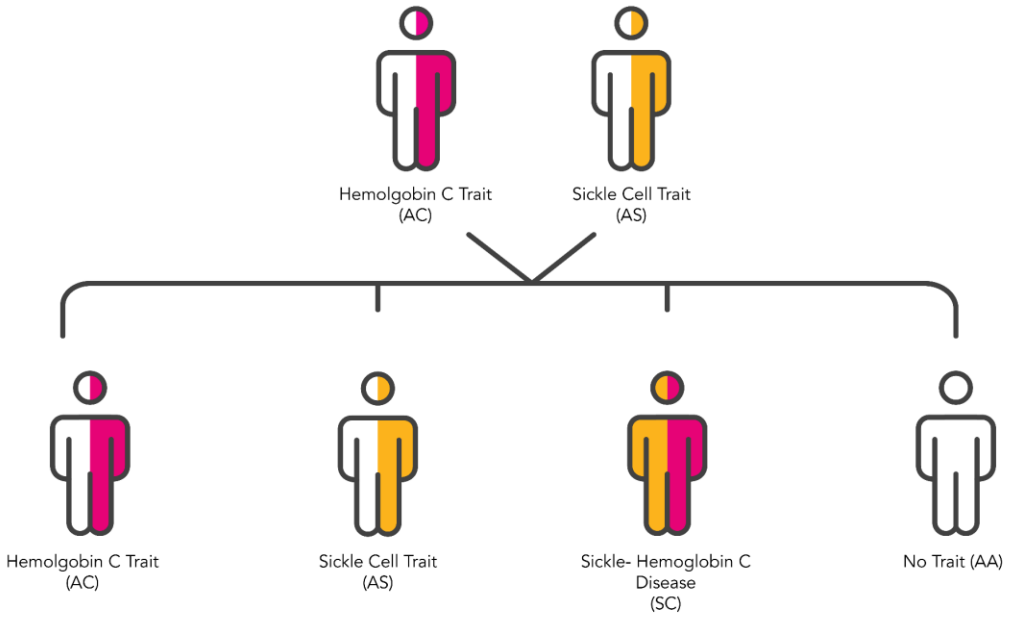
4. Sickle C (SC) disease

Sickle C (SC) disease:

- Happens when a person gets hemoglobin C from one parent and sickle hemoglobin (hemoglobin S) from the other parent. It is a common form of sickle cell disease.
- Shows as FSC on a newborn screen. FSC means fetal plus sickle plus C hemoglobin.
- Causes anemia and serious health problems.
- Requires lifelong medical treatment.

If one parent has the hemoglobin C trait and the other parent has the sickle (hemoglobin S) trait, there is a chance of having a child with sickle C (SC) disease. **For each pregnancy**, there is a:

- 25% (1 in 4) chance of having a child with hemoglobin C trait
- 25% (1 in 4) chance of having a child with sickle cell trait
- 25% (1 in 4) chance of having a child with hemoglobin sickle C (SC) disease
- 25% (1 in 4) chance of having a child without trait or disease



This teaching sheet contains general information only. Talk with your child's doctor or a member of your child's healthcare team about specific care of your child.

In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.