Hemoglobin D

What is hemoglobin?

Hemoglobin is a part of the red blood cell. It 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.
- Babies are born with fetal hemoglobin. This is called hemoglobin F. There is less fetal hemoglobin as babies grow.

What is the difference between hemoglobin trait and 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 D?

Hemoglobin D is:

- A type of hemoglobin that is passed down from parent to child, like hair color or eye color.
- Caused by a mutation, or change, in normal adult hemoglobin A.
- Most common in people from Indian, African or Turkish descent.

There are different types of hemoglobin D patterns:

1. Hemoglobin D trait
2. Hemoglobin DD disease
3. Hemoglobin D/β thalassemia
4. Sickle D (SD) disease

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

Hemoglobin D, continued

1. Hemoglobin D trait

Children with hemoglobin D trait:

- Most often have hemoglobin FAD on their newborn screen.
- Get hemoglobin D from 1 parent and normal hemoglobin A from the other parent.

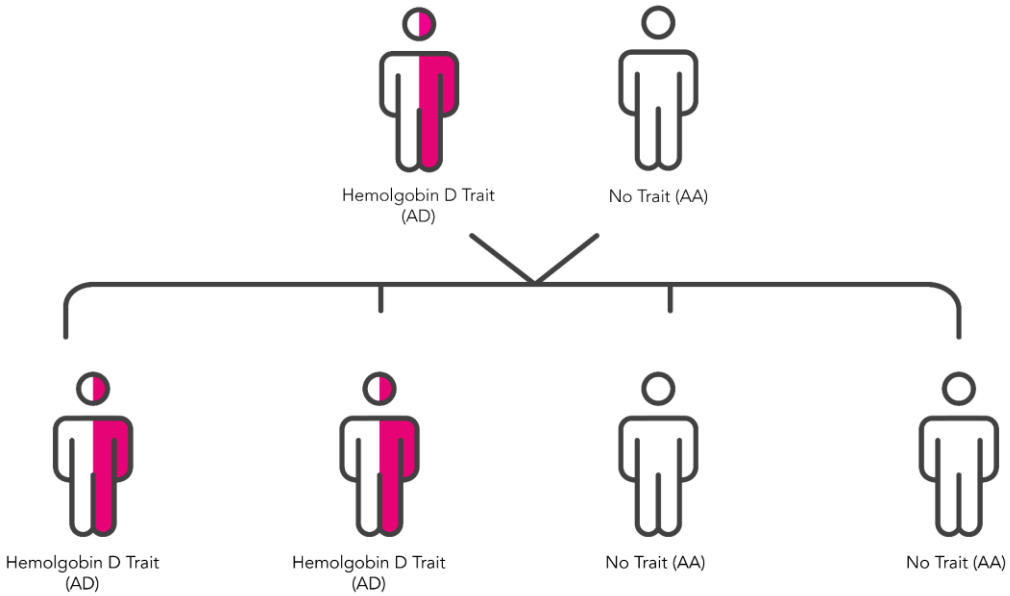
With hemoglobin D trait:

- There is no anemia or other health problems.
- Red blood cells work correctly.
- There are target cells.

Parents with hemoglobin D trait should get blood tests before having children with another person who could have hemoglobin D trait, beta thalassemia trait, sickle cell trait or other abnormal hemoglobins.

If 1 parent has hemoglobin D trait and the other parent has normal hemoglobin, these are the possible hemoglobin types with **each pregnancy**:

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



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

2. Hemoglobin DD disease

Children with hemoglobin DD:

- Most often have hemoglobin FD on their newborn screen.
- Get 2 genes for hemoglobin D (1 from each parent).

Symptoms may include:

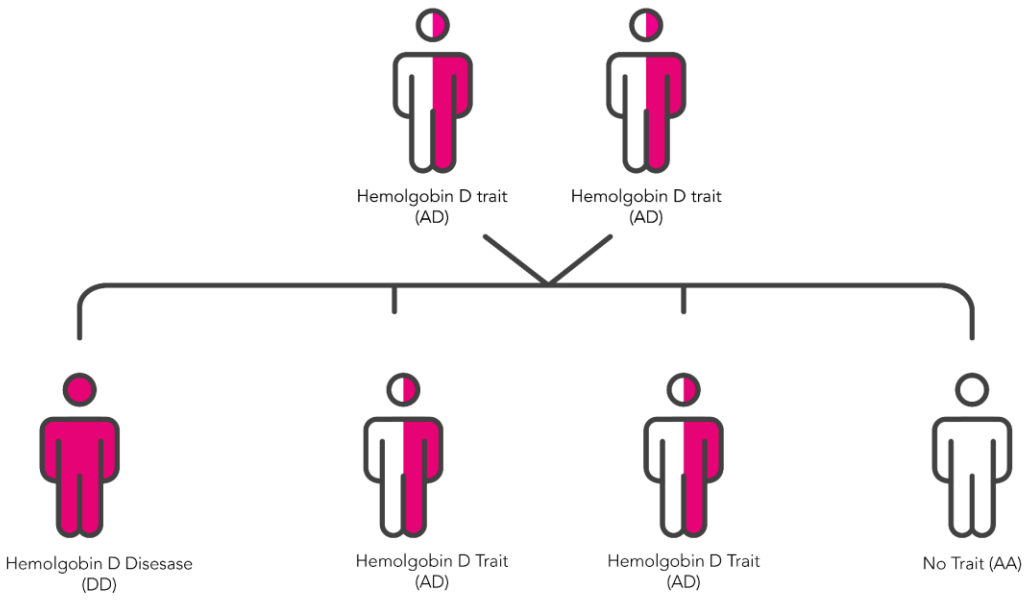
- Mild anemia in young children. Anemia is when there are not enough red blood cells.
- Small red blood cells. The size of red blood cells is called MCV. These small red blood cells still work correctly.
- Very thin red blood cells called target cells. They are called target cells because they look like a target with a bullseye.

Older children may have:

- A large spleen. This is call splenomegaly.
- Higher risk for gallstones.
- Yellow color to the white of the eye and skin. This is called jaundice.

A child could have hemoglobin DD disease if both parents have the hemoglobin D trait. **For each pregnancy**, there is a:

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



3. Hemoglobin D/β thalassemia

Children with hemoglobin D/β thalassemia:

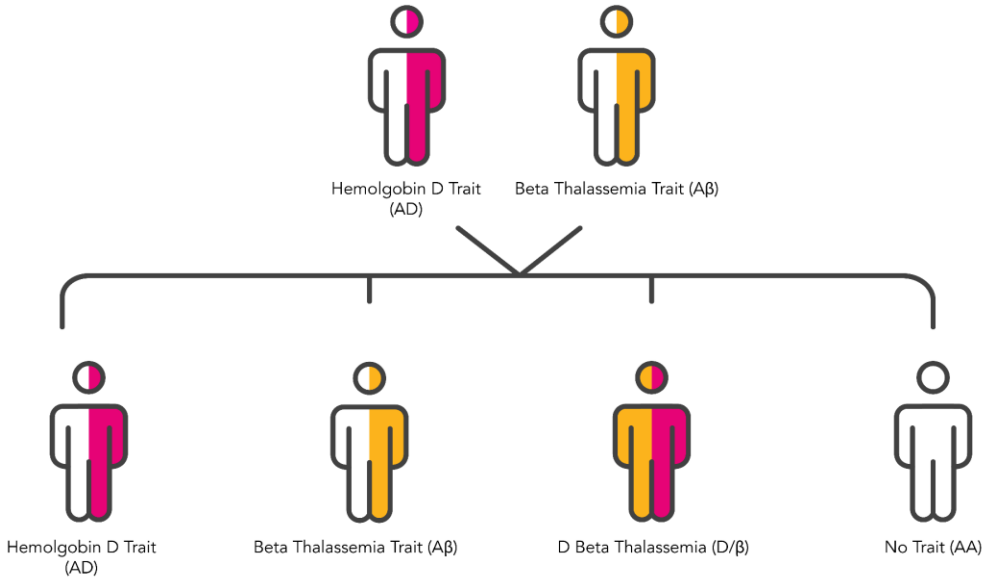
- Most often have hemoglobin FD or FDA on their newborn screen.
- Get hemoglobin D from 1 parent and β Thalassemia from the other parent.

There are different types of hemoglobin D/β thalassemia. Symptoms may include:

- Mild to moderate anemia.
- Splenomegaly
- Higher risk for gallstones.
- Jaundice.

If 1 parent has the hemoglobin D trait and the other parent has β thalassemia, these are the possible hemoglobin types with **each pregnancy:**

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



4. Sickle D (SD) disease

Children with sickle D (SD) disease:

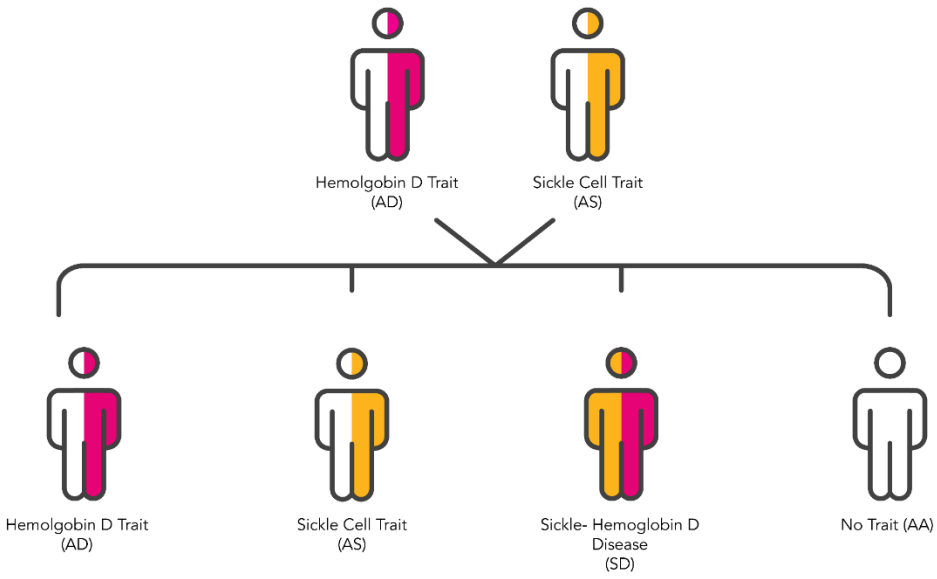
- Most often have hemoglobin FSD on their newborn screen.
- Get hemoglobin D from 1 parent and sickle hemoglobin, called hemoglobin S, from the other parent.

This is a rare form of sickle cell disease. Symptoms may include:

- Anemia and serious health problems
- Lifelong medical treatment

If 1 parent has the hemoglobin D trait and the other parent has the hemoglobin S trait, these are the possible hemoglobin types with **each pregnancy**:

- 25% (1 in 4) chance of having a child with hemoglobin D 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 D 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.