

Why are some people born with a reversal of organs?

by Jacob Silverman



Bodily Organs Image Gallery NBA player Randy Foye has situs inversus totalis, but the condition doesn't affect his life or performance on the court. See [bodily organ pictures](#) to learn more.

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When you look in the mirror, you see a transposed image of yourself. Now imagine having supernatural powers or [x-ray vision](#) and looking into your mirror image to see your internal organs. This is how your organs may look if you had **reversal of organs**. When a person's internal organs are reversed, they appear on opposite sides of the body than they typically are. Also called **situs inversus**, this puzzling and intriguing condition occurs in just 0.01 percent of all people. It's seen equally in males and females [source: [eMedicine](#)].

In many cases, reversal of organs won't lower a person's life expectancy or harm his quality of life. That's why some people never know they have this condition. It can be diagnosed by accident -- an **incidental finding** in an unrelated medical procedure, like an abdominal surgery. Situs inversus and other related disorders can also be diagnosed through [x-ray](#), [ultrasound](#) and [CT scan](#). Using ultrasound, doctors can detect reversal of organs while a fetus is still in the womb.

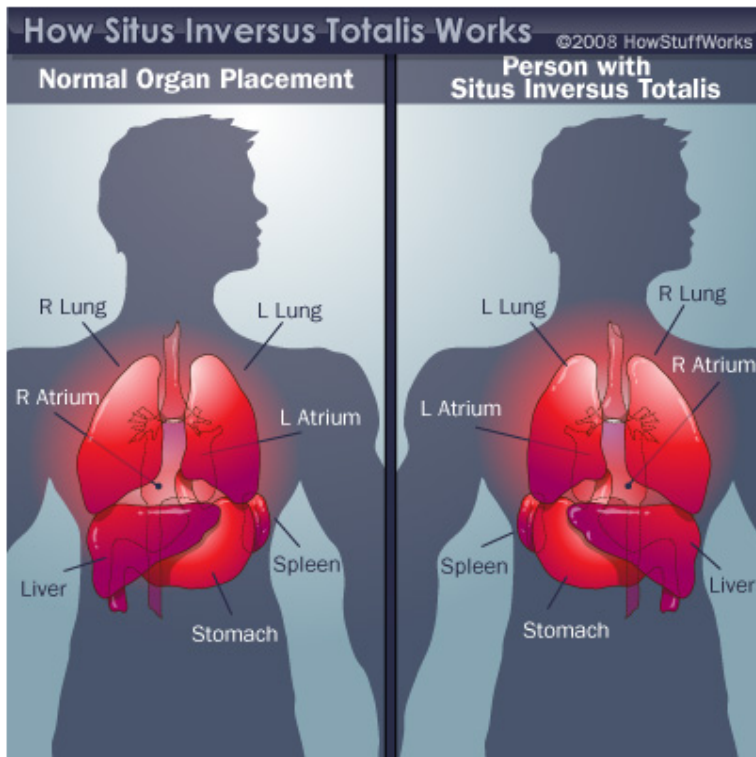
Most of the time, there's no way and no need to treat reversal of organs. Entire organs can't be switched, but accompanying disorders or abnormalities may require treatment.

We still don't know exactly what causes the condition. Scientists only know that a mutation appears in the genes of people whose organs are reversed, but the specific cause of the mutation and its nature are unknown.

Before we explore this medical mystery further, let's cover some related medical terms:

- **Situs solitus:** normal arrangement of internal organs
- **Levocardia:** normal positioning of the heart on the left side of the body
- **Mesocardia:** heart positioned in the center of the chest
- **Dextrocardia:** reversal of the position of the heart

Let's look at some examples and variations of this rare birth defect.



Types of Situs Invertus

Dextrocardia with situs solitus is a congenital condition in which the [heart](#) is located on the right side of the chest but all other internal organs are in their normal positions. One slight difference in anatomy is that normally the left lung is smaller than the right lung in order to accommodate the heart. With dextrocardia, the right lung is smaller. People can still live normally and have no symptoms of dextrocardia, although an attentive doctor should notice the position of the heart during a regular physical.

Although some people live with no symptoms of dextrocardia, others may suffer from additional congenital heart abnormalities. One common abnormality is

transposition of the great arteries. Normally, the left ventricle, the stronger portion of the heart, pumps blood to the entire body. But in this case, it pumps blood next door to the lungs. Meanwhile, the weaker right ventricle, which normally pumps blood to the lungs, is left to pump blood to the rest of the body. Doctors would notice this as soon as a baby is born because the child's skin color looks bluish. This condition -- known as **blue baby** -- happens when a baby doesn't have enough oxygen, but it can also happen for reasons other than transposed arteries.

Generally, there are no complications with situs inversus totalis because the organs are just flipped. Like dextrocardia with situs solitus, someone can live without being aware of his condition. But situs inversus totalis is also associated with some other rare conditions. Three percent of people with situs inversus totalis have some form of [congenital heart disease](#) [source: [Fuster, et al](#)]. Twenty percent of patients with situs inversus totalis also have **Kartagener Syndrome** [source: [Wilhelm](#)]. Not only do people with Kartagener Syndrome suffer from situs inversus totalis, they also suffer from male sterility and abnormalities in the bronchioles of the lungs.

A potentially dangerous form of organ reversal is **situs ambiguus** (sometimes spelled **situs ambiguus**). Like dextrocardia with situs solitus, situs ambiguus occurs in one in 20,000 births [source: [Fuster, et al](#)]. Usually, the liver and stomach appear on the right and left sides of the body, respectively. But with situs ambiguus, both move toward the center, and the stomach develops behind the liver.

Aside from the liver and stomach, there's the matter of the spleen. Someone with situs ambiguus can also have **bilateral rightsidedness** or **bilateral leftsidedness**. With rightsidedness, both sides of the body look how the right side normally looks, causing **asplenia** -- or no spleen. With leftsidedness, a person has **polysplenia** -- spleens on **both** sides of the body. Having no spleen can increase the risk of infection. Polysplenia boosts the chance of rupturing a spleen during an impact or accident causing dangerous internal bleeding. With or without a spleen, 90 percent of situs ambiguus sufferers have congenital heart disease. Some may also have dextrocardia [source: [Fuster, et al, Wilhelm](#)].

Reversal of organs is a rare condition that very few doctors and scientists understand. The good news is that many people born with it lead active lives. However, someone whose organs are reversed may also suffer from other complications.