



Genetic Disorders

genetic disorders, diabetes, muscular dystrophy, Down Syndrome

Genetics Unit

Sometimes it's easy to figure out why you got sick. Maybe your best friend had a cold and gave it to you. Maybe all the kids in your family got chicken pox at the same time. Maybe the flu is going around your classroom. Most of these sicknesses are passed from person to person through sneezes, coughs, and touches. This is why it's so important for people to wash their hands often. Some sicknesses are different, though. It's possible for sicknesses to come from inside us.

The genes in our cells hold the directions that help make us who we are. Most of how we look and act comes from our genes. Half of those directions are passed along from our mothers and half are from our fathers. Sometimes, though, things can go wrong with the genes and that can cause a sickness. A **genetic disorder** is a disease or illness that is caused by something wrong with a person's genes. These sicknesses last through a person's whole life. They can be dangerous.

Many things can cause illnesses from genetic disorders. They may come from only part of one gene. This gene is not supposed to cause a problem. It has a different job in the body, but something went wrong with it. Sometimes the directions the mother or father passed down had a mistake in them. In other cases, it has nothing to do with the parents. There just happens to be trouble in part of a gene before a child is born.

When even one direction in a gene is wrong, it can cause problems. Read these steps for how to eat cereal to see what can happen if just one word is out of place:

How to Eat Cereal

- 1) Set an empty bowl and a spoon on the table.
- 2) Open the cereal box.
- 3) Pour the cereal into the bowl.
- 4) Open the milk and pour it into the bowl.
- 5) Use your chair to bring the cereal into your mouth.
- 6) Chew the cereal.
- 7) Swallow.
- 8) Repeat steps 5, 6, and 7.

Eating cereal would be impossible if you followed these directions. The word “chair” in Step 5 changes everything about how they work. If we change the word “chair” to “spoon,” though, the directions would make sense. This is how the directions in our genes can go wrong. If just one gene is not as it should be, it can affect the way a part of your cell works.

Muscular dystrophy is a sickness that is caused by trouble in part of a gene that leads to weakness in muscles. There are more than thirty different genes that can have this trouble, so this sickness can vary a lot. Some types are more dangerous than others. They all get worse during a person’s life. The sickness can show up at any age. It can attack any muscle. It could make it hard to walk, talk, breathe, or even keep the heart beating. Though this sickness cannot be cured, there are medicines and treatments that can help a person have a better life.

Families may have a history of this sickness. Some people in the family just carry the directions for it but do not get sick. These men and women might want to know if they can pass it on to their children. There are only a few tests that people can take to check if their genes will pass it along. It is not possible to check for most kinds of muscular dystrophy, though scientists are working on more tests. People with family histories of the disease can talk to their doctors to see how likely it is that they will pass it along to their kids.

Too many directions in a gene can also cause a different kind of trouble. Genes make up chromosomes. If there is one extra chromosome in the wrong place it can lead to **Down Syndrome**. This is a sickness that causes learning and health problems. Children with Down Syndrome often need more time to learn, both at home and at school. They may have heart, eye, hearing, and digestive troubles as well.

There is no test parents can take before they decide to have children to find out if their child may be born with Down Syndrome. However, mothers who give birth when they are over 35 are more likely to have children with Down Syndrome. There are tests that mothers can take while they are pregnant that will tell if a baby has Down Syndrome. There is no cure, but it can help parents prepare for taking care of this child. Doctors can help in other ways, too. Operations on the baby's heart or other body parts may be needed. Some medicines are used to help keep away ear infections and other everyday sicknesses that

can be more dangerous to people who have this sickness.

Then there are sicknesses that can be caused by people's genes and the choices they make. One of these is **diabetes**, a sickness where people's bodies cannot control how much sugar is in their blood. Their bodies do not make enough of the chemical that keeps their sugar level where it should be. There are two different kinds of this sickness. One kind can run in families. The other can come from weighing too much and not eating the right foods.

In either case, this sickness can be very dangerous. It can cause blindness or trouble with the heart, kidneys, and blood. Most young people with this illness were born with it in their genes. There is no way to test people before they are born to find out if they will have diabetes. However, doctors can check their family histories to see if it is likely to show up. People cannot get away from their family ties to the sickness, but they can take steps to live better with it. If people get this sickness because of the way they eat or treat their bodies, they may be able stop it or slow it down. They can learn to make choices that will help their bodies start working the right way again. They can exercise, eat well, and stay at a healthy weight.

There are simple things to do that can help keep you from catching and spreading some kinds of sickness, such as colds or flu. Wash your hands well and cough or sneeze into your elbow instead of your hand. But when a sickness comes from genes, it is much harder to stop it. Researchers are working on ways to find those genes and try to fix them before they cause trouble. One day, maybe we can get rid of a lot of these sicknesses, and people can live healthier, happier lives.