

Hello, class. So in today's lesson, we're going to be learning about how our understanding of biological and genetic developments can influence the study of biological and genetic disorders. So it's important to know that genetic or biological disorders can start even before a person is born. A genetic disorder is what we call a biological problem that is passed on from parent to offspring. In other words, it's inherited. And it can be caused by a person's genes. This is what we call an inheritable disorder, because we can figure out from a person's genetic history, or the history of their parents and their relatives, whether they're more likely to actually get this kind of disorder.

Now, genetic disorders can occur on different levels. They can occur on just a gene level, which is what we call a mutation-- a single or only several changes within a person's DNA that lead to some kinds of changes in a person's appearance, behavior, or things like that. It can also occur on a chromosomal level, which is to say that there can be larger chromosomal problems where either a chromosome is missing or divided unevenly or something like that.

An example of a chromosomal disorder is Down Syndrome or what we call Trisomy 21, which is where a person has three of the 21st chromosome instead of the two that they should normally have. This results in certain physical characteristics that you recognize, such as a rounder face or slanted eyes, as well as cognitive impairment, which can vary over time but can result in different kinds of learning deficiencies and things like that. There can also be defects in the sex chromosomes as well-- mainly in the X chromosome. An example of this is either Turner Syndrome or Klinefelter Syndrome.

Now, besides genetic disorders, there can also be problems that occur before birth that can lead to either biological or genetic disorders as well. Congenital disorders are what we call disorders that originate before birth in the womb. They are often due to environmental factors that are introduced at that time. And we say environmental, but they can have long lasting genetic or biological effects. They're just not inherited in the same way as genetic disorders. What we say is that this prenatal time-- this time while the child is in the womb-- is what we call a sensitive period, which is when we have a period of increased sensitivity or susceptibility to environmental influences-- things within the environment-- that can affect a person's development.

A teratogen is what we call any kind of environmental factor that affects a person during prenatal development in the womb. And it can lead to things like birth defects. An example of a teratogen would be radiation or chemicals in the environment, like fertilizers or pesticides. Or the number one teratogen to cause birth defects is drugs, especially in the US-- things like alcohol and tobacco, but also things like marijuana.

A disorder caused by a teratogen is fetal alcohol syndrome, which is caused by heavy and repeated drinking of

alcohol while a child is still in the womb. And this can result in low birth weights, a smaller head-- which means, also, a smaller brain being developed-- body defects, and mental or behavioral retardation as well. So you can see how these, while they're environmental factors, still have just as large if not more of an influence as those biological and genetic disorders.