Pedigrees

by Sophia

WHAT'S COVERED

In this lesson, you will learn to identify how family history can impact the outcome of genes. Specifically, this lesson will cover:

1. Pedigrees

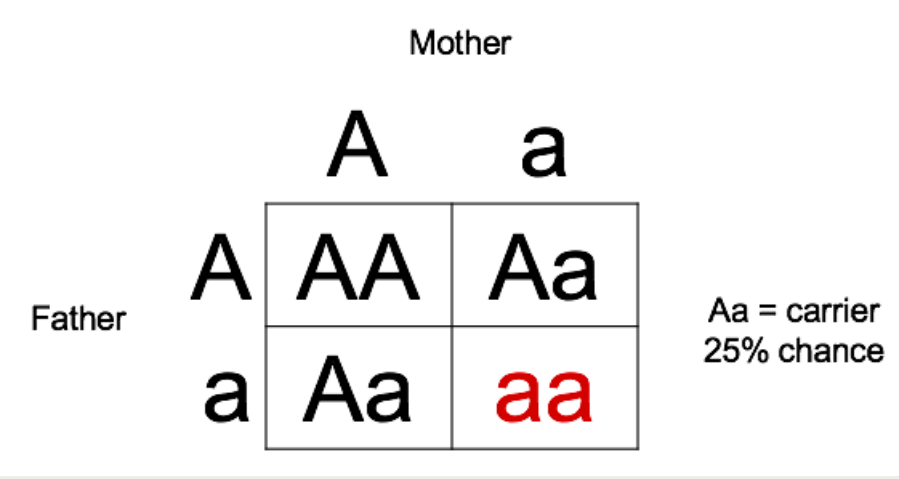
Being able to identify family history is important because it allows parents to assess the risk of their child inheriting a genetic disorder that runs in the family. **Pedigrees** are charts that can help to track the family history of a particular trait.

A **carrier** is a person who is heterozygous for a recessive trait, meaning they have one dominant and one recessive allele. If this recessive trait is for a disease, then they are considered a carrier for the disease. This person only expresses the dominant phenotype, but they still possess the recessive allele. To display the phenotype for that disease, someone would have to have two recessive alleles. It would be important to know who is a carrier if this person were to have a child with another carrier. Their children would then have a chance of inheriting this recessive trait from both parents and contracting the disease.

IN CONTEXT

What are the odds two heterozygous parents (carriers) would have an offspring that expresses only the recessive trait? How would you find this out?

To determine what the chances are, you would need to use a Punnett square:



If you cross two heterozygous people, the square shows there is a 25% chance that their child will inherit that recessive trait.

TERMS TO KNOW

Pedigree

A chart used to track a trait through a family tree.

Carrier

An individual who is carrying a trait genotypically but does not display it phenotypically.

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2. Genetic Abnormality vs. Genetic Disorder

A **genetic abnormality** is a trait that a person can inherit that is an abnormal expression of that trait but doesn't necessarily cause a health problem.

↱ EXAMPLE A person that has six toes. It is an abnormal expression of a trait, but it's not going to cause that person any health problems.

A **genetic disorder**, on the other hand, does cause health issues.

↱ EXAMPLE Huntington's disease is a genetic disorder that results in the breakdown of nerve cells in the brain that results in severe mental and physical degeneration. Huntington's disease is therefore termed a genetic disorder because it actually does cause health problems.

TERMS TO KNOW

Genetic Abnormality

A genetic characteristic that is not typical (example: six toes, which does not prevent a person from enjoying a healthy life).

Genetic Disorder

A genetic characteristic that causes health problems (example: Huntington's Disease, which causes the breakdown of nerve cells in the brain, leading to severe physical and mental degeneration).

SUMMARY

Pedigrees are used to track the family history of a particular trait. This is useful in determining if someone is a carrier for a trait like a recessive disease. If they are, and they have offspring with another carrier for that trait, their offspring will have a chance of expressing that recessive trait. **Genetic abnormalities** are abnormal traits a person can inherit that do not cause health problems, while **genetic disorders** are inherited traits that do cause health problems.

Keep up the learning and have a great day!

Source: This work is adapted from Sophia author Amanda Soderlind.

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An individual who is carrying a trait genotypically but does not display it phenotypically.

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A genetic characteristic that is not typical (example: six toes, which does not prevent a person from enjoying a healthy life).

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A genetic characteristic that causes health problems (example: Huntington's Disease, which causes the breakdown of nerve cells in the brain, leading to severe physical and mental degeneration).

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