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Pituitary Tumors Causes, Risk Factors, and Prevention

Learn about the risk factors for pituitary tumors and if there are things you can do that might help lower your risk.

Risk Factors

A risk factor is anything that increases your chances of getting a disease. Learn more about the risk factors for pituitary tumors.

- [Risk Factors for Pituitary Tumors](#)
- [What Causes Pituitary Tumors?](#)

Prevention

The risk of many types of cancer can be reduced with certain lifestyle changes (such as staying at a healthy weight or quitting smoking). But pituitary tumors have not been linked with any known outside risk factors.

- [Can Pituitary Tumors Be Prevented?](#)

Risk Factors for Pituitary Tumors

- [Family history](#)

- [Genetic syndromes](#)

A risk factor is anything that increases a person's chances of getting a disease. For example, smoking is a risk factor for lung cancer and many other cancers.

But having a risk factor, or even many risk factors, does not mean that you will get the disease. And many people who get the disease may have few or no known risk factors.

Pituitary tumors have only a few known risk factors.

Family history

Most people who develop pituitary tumors don't have a family history of the disease. But rarely, pituitary tumors can run in families.

Sometimes when pituitary tumors run in families, they are found as part of a genetic syndrome, often along with other types of tumors (see the next section).

Sometimes, though, the cause of pituitary tumors that run in families is not known.

Genetic syndromes

Pituitary tumors can sometimes be a part of a syndrome that often includes an increased risk of other types of tumors as well. These syndromes are caused by changes (mutations) in a person's genes, which are often inherited from a parent. Syndromes that increase a person's risk of pituitary tumors include:

Multiple endocrine neoplasia, type I (MEN1): This is a hereditary condition in which people have a very high risk of developing tumors of the pituitary, parathyroid, and pancreas. This syndrome is caused by changes in the *MEN1* gene, and it is passed on to about half of the children of an affected parent.

Multiple endocrine neoplasia, type IV (MEN4): This rare syndrome is very similar to MEN1, in that people with MEN4 have increased risks of pituitary tumors and certain other tumors. But MEN4 is caused by changes in the

the *GNAS* gene, which aren't inherited but occur before birth.

Carney complex: This is a rare syndrome in which people have changes in skin coloring, as well as a high risk of some types of benign (non-cancerous) tumors, including pituitary tumors. Many cases are caused by inherited changes in the *PRKAR1A* gene, but some are caused by changes in other genes that have not yet been identified.

Familial isolated pituitary adenoma (FIPA): In this syndrome, only pituitary tumors run in the family. This syndrome is sometimes caused by changes in the *AIP* gene,

What Causes Pituitary Tumors?

- [Inherited versus acquired gene mutations](#)

We don't know exactly what causes most pituitary tumors. But in recent years, researchers have made great progress in understanding how certain changes in the DNA in pituitary cells can lead to them forming a tumor.

DNA in our cells makes up our **genes**, which control how our cells function. We usually look like our parents because they are the source of our DNA. But our genes affect more than how we look.

Some genes normally help control when our cells grow, divide to make new cells, repair mistakes in DNA, or cause cells to die when they're supposed to. If these genes aren't working correctly, it can lead to cells growing out of control. For example:

- Changes (mutations) in genes that normally help cells grow, divide, or stay alive can lead to these genes being more active than they should be, causing them to become **oncogenes**. These genes can result in cells growing out of control. Genes that normally help keep cell division under control or cause cells to die at the

are no known environmental causes for pituitary tumors. The gene changes in these tumors might just be random events that sometimes happen when a cell divides, without having an outside cause.

In pituitary tumors that don't run in families, sometimes the tumor cells have acquired mutations in genes such as *AIP*, *GNAS*, *USP8*, *USP48*, and *BRAF*. These mutations are much more common in some types of pituitary adenomas than in others.

Changes in other genes have also been found in some types of pituitary adenomas, but in many cases it's not clear which gene changes might have caused the tumor, or even if abnormal genes are always needed for pituitary tumors to form.

Because there are no known lifestyle-related or environmental causes of pituitary tumors, it's important to remember that there is nothing people with these tumors could have done to prevent them.

Hyperlinks

1. www.cancer.org/cancer/understanding-cancer/genes-and-cancer/oncogenes-tumor-suppressor-genes.html
2. www.cancer.org/cancer/risk-prevention/genetics/genetic-testing-for-cancer-risk.html

References

National Cancer Institute. Physician Data Query (PDQ). Pituitary Tumors Treatment. 2020. Accessed at <https://www.cancer.gov/types/pituitary/patient/pituitary-treatment-pdq> on July 12, 2022.

Tatsi C, Stratakis CA. The genetics of pituitary adenomas. *J Clin Med*. 2019;9(1):30.

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Can Pituitary Tumors Be Prevented?

Certain lifestyle changes (such as staying at a [healthy weight](#)¹ or _____)

[us/policies/content-usage.html](#)).

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