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Pituitary Tumors Causes, Risk Factors, and Prevention

Risk Factors

A risk factor is anything that affects your chance 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. As a result, there is no known way to prevent these tumors at this time.

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

A risk factor is anything that changes a person's chance of getting a disease. For example, smoking is a risk factor for cancer of the lung 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 very few known risk factors, and these are related to genetics. There are no known environmental or lifestyle-related risk factors for pituitary tumors. Though science has suggested that people who are overweight or obese might be at increased risk.

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 along with other types of tumors as part of an inherited genetic syndrome (see the next section).

Sometimes, though, only pituitary tumors occur. Researchers have found that some of these are due to certain changes in a person's genes that are inherited from a parent. (See [What Causes Pituitary Tumors?](#))

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

Genetic syndromes

Pituitary tumors can be a part of a syndrome that includes an increased risk of other types of tumors. These syndromes are caused by abnormal changes (mutations) in a person's genes. They include:

Multiple endocrine neoplasia, type I (MEN1): This is a hereditary condition in which people have a very high risk of developing tumors of 3 glands: the pituitary, parathyroid, and pancreas. It is caused by changes in the gene *MEN1*, and is passed on to about half of the children of an affected parent. If the MEN1 syndrome affects your family, you should discuss testing for this condition with your doctor.

Multiple endocrine neoplasia, type IV (MEN4): This rare syndrome includes increased risks of pituitary tumors and certain other tumors. MEN4 is caused by inherited changes in a gene called *CDKN1B*.

McCune-Albright syndrome: This syndrome is caused by changes in a gene called *GNAS1* that aren't inherited but occur before birth. People with this syndrome have brown patches on their skin (called *café-au-lait spots*) and develop many bone

problems. They can also have hormone problems and pituitary tumors.

Carney complex: This is a rare syndrome in which people can have heart, skin, and adrenal problems. They also have a high risk of a number of different types of tumors, including pituitary tumors. Many cases are caused by inherited changes in the gene *PRKAR1A*, but some are caused by changes in other genes that have not yet been identified.

You can learn more about inherited cancer syndromes in [Family Cancer Syndromes](#)¹.

Hyperlinks

1. www.cancer.org/cancer/cancer-causes/genetics/family-cancer-syndromes.html

References

Wiedmann MKH, Brunborg C, Di Ieva A, et al. Overweight, obesity and height as risk factors for meningioma, glioma, pituitary adenoma and nerve sheath tumor: a large population-based prospective cohort study. *Acta Oncol.* 2017;56(10):1302-1309.

See all references for Pituitary Tumors (www.cancer.org/cancer/pituitary-tumors/references.html)

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What Causes Pituitary Tumors?

Scientists don't know exactly what causes most pituitary tumors. During the past few years, they have made great progress in understanding how certain changes in a person's DNA can cause cells in the pituitary to produce a tumor. DNA is the chemical in each of our cells that makes up our *genes* – the instructions for how our cells function. We usually look like our parents because they are the source of our DNA. But DNA affects more than how we look.

Some genes control when cells grow, divide into new cells, and die. Genes that help

cells grow, divide, and stay alive are called *oncogenes*. Genes that slow down cell division or cause cells to die at the right time are called *tumor suppressor genes*. Tumors can be caused by DNA changes that turn on oncogenes or turn off tumor suppressor genes.

Some people inherit gene mutations (changes) from their parents that greatly increase their risk for developing pituitary tumors. Some of these mutations were described in [Risk Factors for Pituitary Tumors](#). Members of families with these genetic syndromes can have genetic testing to find out if they are affected.

But often, gene mutations occur during life rather than having been inherited. In some types of cancer, these *acquired* mutations can be caused by outside exposures, such as radiation or cancer-causing chemicals. Most pituitary tumors are not cancers, and there are no known environmental causes for these tumors. The gene changes in these tumors might just be random events that sometimes happen when a cell divides, without having an outside cause.

Some non-hereditary (sporadic) pituitary tumors – those that don't run in families – have acquired mutations in a gene called *AIP*. Many growth hormone-secreting adenomas have an acquired mutation in a gene called *GNAS1*. These mutations are much less common in other types of pituitary adenomas.

Changes in other genes have been found in other types of pituitary adenomas, but it's not clear if abnormal genes are always needed for pituitary tumors to form. What is known is that there is a loss of the regulatory mechanism that normally keeps the pituitary cells from growing and making too much hormone.

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.

References

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Can Pituitary Tumors Be Prevented?

The risk of many types of cancer can be reduced with certain lifestyle changes (such as staying at a [healthy weight](#)¹ or [quitting smoking](#)²). But pituitary tumors have not been linked with any known outside risk factors. As a result, there is no known way to prevent these tumors at this time.

Still, for people at high risk of pituitary tumors (because of certain [inherited syndromes](#)), there may be ways to find and treat them early, before they cause problems. (See [Can Pituitary Tumors Be Found Early?](#)³)

Hyperlinks

1. www.cancer.org/healthy/eat-healthy-get-active.html
2. www.cancer.org/healthy/stay-away-from-tobacco.html
3. www.cancer.org/cancer/pituitary-tumors/detection-diagnosis-staging/detection.html

References

See all references for Pituitary Tumors (www.cancer.org/cancer/pituitary-tumors/references.html)

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