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PDF generated on May 31, 2016 from http://www.cancer.net/cancer-types/endocrine-tumor/risk-factors

Endocrine Tumor - Risk Factors [1]

This section has been reviewed and approved by the Cancer.Net Editorial Board [2], 03/2014

ON THIS PAGE: You will find out more about the factors that increase the chance of developing this type of tumor. To see other pages, use the menu on the side of your screen.

A risk factor is anything that increases a person's chance of developing a tumor. Although risk factors often influence the development of a tumor, most do not directly cause the disease. Some people with several risk factors never develop a tumor, while others with no known risk factors do. However, knowing your risk factors and talking about them with your doctor may help you make more informed lifestyle and health care choices.

The following factors may raise a person's risk of developing specific types of endocrine tumors:

Age. Different age groups are more likely to develop different types of endocrine tumors. Pheochromocytoma is most common between age 40 and 60. Merkel cell cancer is most common in people older than 70. Thyroid cancer in general can occur at any age, while anaplastic thyroid cancer is usually diagnosed after age 60. Older infants (10 months and older) and adolescents can develop medullary thyroid cancer, especially if they carry the *RET* protooncogene mutation (see below). For a gastrointestinal carcinoid tumor, the average age at diagnosis is 55 to 65. For a carcinoid tumor of the appendix, the average age at diagnosis is about 40. For a lung carcinoid tumor, the average age at diagnosis is between 45 and 55. Children rarely develop a carcinoid tumor.

Gender. Men are more likely to develop pheochromocytoma than women by a three to two ratio. Men are also more likely to develop Merkel cell cancer than women. However, women are two to three times more likely to develop thyroid cancer than men.

Race. A gastrointestinal carcinoid tumor is more common among black people than white people, and black men have a higher risk than black women. Among white people, men and women have the same risk. White people are most likely to develop Merkel cell cancer; however, some black people and Polynesians have developed this type of cancer. White people and Asian people are more likely to develop thyroid cancer.

Family history of multiple endocrine neoplasia, type 1. <u>Multiple endocrine neoplasia, type 1 (MEN1)</u> [3] is a hereditary condition that increases the risk of developing a tumor of three glands: pituitary, parathyroid, and pancreas. It is also estimated that approximately 10% of gastrointestinal carcinoid tumors are associated with MEN1.

Other family history/genetics. Ten percent of pheochromocytomas are linked to hereditary causes. A history of parathyroid tumors in a family with MEN1 may raise a person's risk of developing a parathyroid tumor. People with other hereditary conditions are at higher risk of developing adrenal gland tumors, including Li-Fraumeni syndrome [4] and Carney Complex [5]. Carney Complex can also raise the risk of a pituitary gland tumor. In addition, some types of thyroid cancer are associated with genetic factors:

- An abnormal *RET* gene, which can be passed from parent to child, may cause medullary thyroid cancer. Not everyone with an altered *RET* gene will develop cancer. Blood tests and genetic tests can find the gene. Once the altered *RET* gene is found, a doctor may recommend surgery to remove the thyroid before cancer develops. People with medullary thyroid cancer should talk with their doctor about genetic testing to find out if they have a mutation of the *RET* proto-oncogene. If so, genetic testing of siblings and children will be recommended.
- A family history of medullary thyroid cancer increases a person's risk. People with the syndrome <u>multiple endocrine neoplasia, type 2 [6]</u> (MEN2) are also at risk for developing medullary thyroid cancer and other cancers.
- A family history of goiters increases the risk of papillary thyroid cancer.
- A family history of precancerous polyps in the colon increases the risk of papillary thyroid cancer.

Learn more about genetic testing [7].

Immune suppression. People with the human immunodeficiency virus (HIV), the virus that causes acquired immunodeficiency syndrome (AIDS), and people whose immune systems are suppressed because of organ transplantation have a higher risk of developing a neuroendocrine tumor.

Arsenic exposure. Exposure to the poison arsenic may increase the risk of Merkel cell cancer.

Sun exposure. Because Merkel cell cancer often occurs on the sun-exposed areas of the head and neck, many doctors think that sun exposure may be a risk factor for developing the cancer.

Learn more about protecting your skin from the sun [8].

Radiation exposure. Exposure to moderate levels of radiation therapy may increase the risk of papillary thyroid cancer and follicular thyroid cancer. Potential sources of exposure include the following:

- Low-dose to moderate-dose x-ray treatments used before 1950 to treat children with acne, tonsillitis, and other head and neck problems may increase the risk of papillary and follicular thyroid cancer.
- People who have been treated with radiation therapy for <u>Hodgkin lymphoma</u> [9] or <u>other</u> <u>forms of lymphoma</u> [10] in the head and neck are at an increased risk for developing papillary and follicular thyroid cancer.
- One or more exposures to radioactive iodine (also called I-131), especially in childhood, may increase the risk of papillary and follicular thyroid cancer. Sources of I-131 include radioactive fallout from atomic weapons testing during the 1950s and 1960s, nuclear power plant accidents (for example, the 1986 Chernobyl nuclear power plant accident and the 2011 earthquake and tsunami that damaged nuclear power plants in Japan), and environmental releases from atomic weapon production plants.

Diet low in iodine. Iodine is needed for normal thyroid functioning. In the United States, iodine is added to salt to help prevent thyroid problems.

Stomach conditions. People with diseases that damage the stomach and reduce acid production have a greater risk of developing a stomach carcinoid tumor. In particular, this includes pernicious anemia, a type of anemia characterized by very large, abnormal red blood cells.

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