



What you should know about Cowden syndrome

Cowden syndrome, also known as *PTEN* Hamartoma Tumor Syndrome (PHTS), is a genetic condition that leads to the development of overgrowth in many tissues. The condition is also associated with an increased risk for breast cancer, non-medullary thyroid cancer and endometrial cancer. Individuals with Cowden syndrome may also develop non-cancerous skin, breast, thyroid and uterine lesions. Cowden syndrome is due to a mutation in the *PTEN* gene.

Cancer Risks and Features Associated with Cowden syndrome

Cancer Type	General Population Risk	Cowden Syndrome Risk
Breast Cancer	12%	25%-50%
Thyroid Cancer (non-medullary)	1.3%	3%-10%
Endometrial Cancer	2.6%	5%-10%
Colorectal Cancer	5%	9%-16%
Data to suggest that there may be increased risks for other cancers, such as renal cancer, colon cancer, and melanoma.		

In addition to the increased risk for certain types of cancer, individuals with Cowden syndrome may also have multiple other features, such as:

- Larger than average head size (macrocephaly)
- Benign skin lesions on the face and limbs (trichilemmomas, papillomatous papules, and acral and plantar keratosis)
- Polyps in the stomach, small bowel or colon (usually hamartomatous polyps)
- Non-cancerous thyroid lesions (goiter, nodules)
- Adult Lhermitte-Duclos disease (tumor of the cerebellum)

Genetics and Inheritance of Cowden syndrome

Genes are our body's instructions. They provide our body with information about how to grow and develop. When there is a mutation in a gene, it can cause the gene to no longer function correctly. Each person has two copies of every gene. One copy is inherited from their mother and the other copy is inherited from their father.

Cowden syndrome is due to a mutation in the *PTEN* gene. Cancer risks associated with Cowden syndrome) are inherited in an autosomal dominant manner. This means that children, siblings and parents of individuals with a *PTEN* mutation have a 50% (1 in 2) chance of having the mutation as well. Both males and females can inherit a *PTEN* mutation and can pass it on to their children.

Most people with Cowden syndrome inherit the condition from a parent who has a mutation in the *PTEN* gene; however, about 10-50% of the time an individual with Cowden syndrome is the first person in the family to have the condition.

Managing Cancer Risks

The National Comprehensive Cancer Network provides regularly updated guidelines for management of individuals with Cowden syndrome. When possible, individuals with Cowden syndrome should seek management with physicians or centers who are experienced with this condition.

- Annual mammogram and breast MRI starting at age 30-35 years for women
- Risk reducing mastectomy and hysterectomy are surgical options for women
- Annual thyroid ultrasound starting at age 7 years
- Colonoscopy every 5 years starting at age 35 years
- Consider renal ultrasound at age 40 years, then every 1-2 years
- Annual dermatologic exam

When to Consider Evaluation for Cowden syndrome

- Relative with a *PTEN* mutation
- An individual with macrocephaly and breast, thyroid *or* endometrial cancer
- Breast, thyroid *or* endometrial cancer in the presence of multiple mucocutaneous lesions, thyroid lesions, hamartomatous polyps, fibrocystic breast disease or autism
- Adult Lhermite-Duclos disease

Genetic Counseling

In many families, the cancer history may be due to a combination of genetic and environmental factors. In addition, other genetic conditions (i.e. other gene mutations) may appear clinically similar to Cowden syndrome. For this reason, a detailed review of the family history by a genetics professional is important before pursuing genetic testing. A genetic counselor can help determine which, if any, genetic tests may be helpful for a family and review the benefits, risks and limitations of genetic testing. Genetic testing is usually performed through a blood or saliva sample.

Genetic test results can be complicated and are most useful when interpreted by a genetics professional in the context of an individual's personal and family history. To locate a genetic counselor near you, please visit www.nsgc.org and click on the 'Find a Genetic Counselor' link.

Genetic Discrimination

The Genetic Information Nondiscrimination Act (GINA) was signed into federal law in 2008. GINA prohibits health insurers and most employers from discriminating against individuals based on genetic information (including the results of genetic tests and family history information). According to GINA, health insurance companies cannot consider genetic information to be a preexisting condition, nor can they use it to make decisions regarding coverage or rates. GINA also makes it illegal for most employers to use genetic information in making decisions about hiring, firing, promotion, or terms of employment. It is important to note that GINA does not offer protections for life insurance, disability insurance, or long-term care insurance. More information about GINA can be found by contacting a local genetic counselor or by visiting www.ginahelp.org.

References

- National Comprehensive Cancer Network, NCCN Clinical Practice Guidelines in Oncology Genetic/Familial High-Risk Assessment: Breast, Ovarian, and Pancreatic, v.1.2020 retrieved December 12, 2019 from www.nccn.org
- Cowden Syndrome: *A Guide for patients and their families*: www.uihealthcare.org/2column.aspx?id=22923