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Women and Thyroid Disease

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Answers for life.

Women and Thyroid Disease

Thyroid disease is one of the most common endocrine disorders and affects people of all ages and races, but it predominantly impacts women.



What Is Thyroid Disease?

The thyroid is a butterfly-shaped gland that rests in the middle of the lower neck. Its primary function is to control the body's metabolism. In order for the thyroid gland to function properly, it must maintain the correct amount of thyroid hormone to keep the body's metabolism at an acceptable rate. If there is too much or not enough hormone, metabolism is affected.

Hypothyroidism

When the thyroid gland is underactive, improperly formed at birth, surgically removed (all or in part), or becomes incapable of producing enough thyroid hormone, a person is said to be hypothyroid. One of the most

common causes of hypothyroidism is the autoimmune disease called Hashimoto's disease, in which antibodies gradually target the thyroid and destroy its ability to produce thyroid hormone.

Globally, the prevalence of Hashimoto's disease is 1%, but subclinical hypothyroidism affects 4% of the population. Females make up the vast majority of the patients at a ratio of 8:1, female to male.¹

Who Is at Risk?

Risk factors include:²

- Family history: Having a relative with autoimmune thyroid disease.
- Age: Hypothyroidism can start at any age, but the risk keeps growing as people get older.

- Gender: Hypothyroidism is more common in women than men. It is much more common in young women than young men, but as men get older, they start to catch up.
- Race: Hypothyroidism is common in Caucasians and Asians. African-Americans are at lower risk.
- Presence of other autoimmune disorders
- Down syndrome or Turner's syndrome
- The rate of hypothyroidism goes up:
 - During pregnancy
 - After delivery
 - Around menopause



Hypothyroidism Symptoms

Symptoms of hypothyroidism tend to develop slowly, often over several years. They may include the following:^{2,3}

- Dry, itchy skin
- Dry, coarse hair or hair loss
- Mild weight gain, and difficulty losing weight
- Slower thinking, memory loss
- Fatigue
- More frequent and severe muscle cramps and joint aches
- Puffiness around the face
- Heavier and/or more frequent menstrual periods
- Goiter (swelling in the front of the neck, caused by enlargement of the thyroid; goiter is most likely to be part of Hashimoto's thyroiditis)
- Shrinking thyroid
- Slowing of heart rate
- Slightly higher blood pressure
- Higher cholesterol levels



Hyperthyroidism

When the thyroid gland becomes overactive and produces too much thyroid hormone, a person is said to be hyperthyroid. The most common cause of hyperthyroidism is the autoimmune condition known as Graves' disease.

Graves' Disease

Graves' disease is an autoimmune disorder that leads to overactivity of the thyroid gland—hyperthyroidism. It is caused by an abnormal immune system response that causes the thyroid gland to produce too much thyroid hormone. Graves' disease is most common in women over age 20.



Graves' Disease Symptoms

Common signs and symptoms of Graves' disease include:

- Irritability
- Difficulty sleeping
- Fatigue
- A rapid or irregular heartbeat
- A fine tremor of the hands or fingers
- An increase in perspiration or warm, moist skin
- Sensitivity to heat
- Weight loss, despite normal eating habits
- Enlargement of the thyroid gland (goiter)
- Change in menstrual cycles
- Bulging eyes (Graves' ophthalmopathy)
- Thick, red skin, usually on the shins or tops of the feet (Graves' dermopathy)

About half the people with Graves' disease show some signs and symptoms of a condition known as Graves' ophthalmopathy. In Graves' ophthalmopathy, inflammation and other immune-system events affect muscles and other tissues around the eyes.

Graves' Disease Risk Factors

A number of factors can increase the risk of Graves' disease, including:⁴

- Family history
- Gender. Women are much more likely to develop Graves' disease than are men, at a ratio of 7:1.
- Age. Graves' disease usually develops in people younger than 40.
- Other autoimmune disorders
- Emotional or physical stress
- Pregnancy or recent childbirth
- Smoking

Thyroid and Pregnancy

Thyroid disorders are the second most common endocrinologic disorders found in pregnancy. Overt hypothyroidism is estimated to occur in 0.3–0.5% of pregnancies. Subclinical hypothyroidism appears to occur in 2–3%, and hyperthyroidism is present in 0.1–0.4%.

Postpartum thyroiditis (PPT) reportedly affects 4–10% of women. PPT is an autoimmune thyroid disease that occurs during the first year after delivery. Women with PPT can present transient thyrotoxicosis, hypothyroidism, or transient thyrotoxicosis followed by hypothyroidism. This presentation may be unrecognized, but is important because it predisposes the woman to develop permanent hypothyroidism.⁵

Thyroid Cancer

Thyroid cancer is the most common endocrine cancer. There are four main types of thyroid cancer, which are classified by how the cancer cells appear under a microscope: papillary, follicular, medullary, and anaplastic.⁶

Most thyroid cancers grow very slowly and can either be cured or treated successfully. Only anaplastic thyroid cancer, which represents 1% of thyroid cancers, grows quickly and is difficult to control.

The worldwide incidence of thyroid cancer is increasing. This may be due to increased detection of small tumors using new, more sensitive diagnostic procedures, as well as a true increase in the overall number of cancers, a possible consequence of increased exposure to radiation or other undiscovered environmental carcinogens.⁶

Thyroid Cancer Symptoms

Thyroid cancer typically does not present with early symptoms and is found during a routine physical exam. The thyroid is a tiny gland (not much bigger than a coin) and typically cannot be felt through the skin. Swelling or a lump in the neck is the most common symptom of thyroid cancer. As the tumor gets larger, other symptoms may begin to occur, such as difficulty in swallowing and hoarseness.

Thyroid Cancer Risk Factors

- Low iodine diet: Increase in follicular thyroid cancer
- Gender and age: Women are three times more likely than men to develop thyroid cancer. Women are most often diagnosed at ages 40–50, men in their 60s or 70s.
- Radiation: Exposure may come from certain medical treatments (e.g., neck radiation treatments in childhood) and radioactive fallout from power plant accidents and nuclear weapons.
- Hereditary conditions and family history: Especially medullary thyroid cancer

Siemens Solutions for Thyroid Testing

	ADVIA Centaur® Systems	Dimension® RxL Max®/ Xpand® Plus Systems	Dimension® EXL™ Systems	Dimension Vista® Systems	IMMULITE® Systems
Detection					
TSH	•		•	•	•
FT3	•		•	•	•
FT4	•	•	•	•	•
T4	•	•	•	•	•
T3	•				•
Thyroglobulin	•*				•
Anti-Tg	•				•
Anti-TPO	•				•
T Uptake	•	•	•	•	•
TSI					•*
TBG					•
Management					
TSH	•	•	•	•	•
Thyroglobulin	•*				•
Anti-Tg	•				•
TSI					•*

* In development.

References

1. Environmental Health Criteria 236: Principles and methods for assessing autoimmunity associated with exposure to chemicals. World Health Organization. 2006.
2. Website [Internet]. Available from: <http://www.mayoclinic.org/diseases-conditions/hypothyroidism/basics/causes/con-20021179>
3. Website [Internet]. Available from: http://my.clevelandclinic.org/disorders/hyperthyroidism/hic_hyperthyroidism.aspx
4. <http://www.mayoclinic.org/diseases-conditions/graves-disease/basics/risk-factors/con-20025811>
5. Website [Internet]. Available from: <http://emedicine.medscape.com/article/261913-overview>
6. Pellegriti G, et al. Worldwide increasing incidence of thyroid cancer: update on epidemiology and risk factors. Journal of Cancer Epidemiology. 2013;Article ID 965212.

Caring for Women with Thyroid Disease

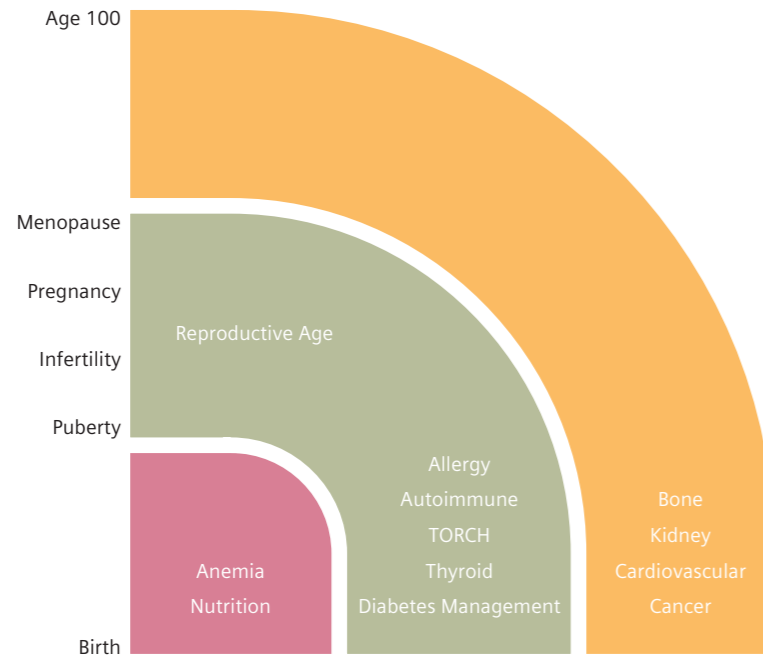
Fast and accurate diagnosis of thyroid disease is important to start appropriate treatment to alleviate symptoms. Routine monitoring of treatment will ensure that the patient is properly managed.

Important tools to aid in the diagnosis of thyroid disease include:

- Clinical evaluation: patient history, physical evaluation
- Medical imaging
- Thyroid function blood tests

As an integrated healthcare company, Siemens' comprehensive solutions, which include multiple imaging modalities, support thyroid care for a lifetime, including accurate diagnosis and monitoring. In addition, our solutions in healthcare IT support the exchange of data for making informed decisions.

Women's Lifetime Health Continuum



Your results. Her lifetime.

Empowering you to advance the health and vitality of women throughout the continuum of life.