Thyroid disorders and fertility

Why the thyroid matters for fertility

The thyroid gland produces thyroxine, or T4, and triiodothyronine, or T3. These hormones influence metabolism in nearly every tissue, including the ovaries, endometrium, liver, and pituitary gland. In reproductive physiology, thyroid function is closely linked to the hypothalamic-pituitary-ovarian axis, the hormonal network that coordinates follicle development, ovulation, luteal function, and preparation of the uterine lining.

When thyroid hormone levels are too low or too high, the body may alter secretion of gonadotropin-releasing hormone, luteinizing hormone, follicle-stimulating hormone, prolactin, and sex hormone-binding globulin. These shifts can contribute to irregular ovulation, anovulation, altered estrogen metabolism, luteal phase abnormalities, and menstrual changes. Some people notice obvious cycle disruption, while others have subtle thyroid-related hormonal imbalance that is only discovered during fertility evaluation.

Fertility is multifactorial. Thyroid status is one piece of a broader picture that may include age, ovarian reserve, sperm parameters, tubal factors, uterine anatomy, endometriosis, PCOS, weight, medications, and chance. Still, because

thyroid disorders are relatively common and treatable in many cases, evaluation of thyroid function is a meaningful part of preconception and infertility care.

Hypothyroidism: underactive thyroid and conception

Hypothyroidism means the thyroid is not producing enough thyroid hormone for the body's needs. In overt hypothyroidism, TSH is typically elevated and free T4 is low. Symptoms may include fatigue, cold intolerance, constipation, dry skin, weight gain, low mood, heavier or irregular periods, and slowed heart rate, although symptoms can be nonspecific.

From a fertility perspective, overt hypothyroidism may interfere with ovulation and menstrual regularity. Elevated thyrotropin-releasing hormone can increase prolactin, and high prolactin may suppress gonadotropin secretion, making ovulation less predictable. Hypothyroidism may also affect luteal function and endometrial development, which are relevant to implantation and early pregnancy support.

Untreated or inadequately treated overt hypothyroidism is also associated with adverse pregnancy outcomes, including miscarriage and complications later in pregnancy. For this reason, people with known hypothyroidism are often advised to optimize thyroid status before attempting conception and to contact their clinician promptly after a positive pregnancy test, because levothyroxine requirements commonly increase early in pregnancy.

Levothyroxine is a standard treatment for hypothyroidism, but dose decisions and TSH targets should be made by a healthcare professional. This is especially important in fertility care, where pregnancy-specific reference ranges, antibody status, and assisted reproduction plans may affect management.

Subclinical hypothyroidism: why the evidence is more nuanced

Subclinical hypothyroidism is usually defined as elevated TSH with normal free T4. It is common in reproductive-age women and frequently arises during infertility workups. The key clinical challenge is that not all mild TSH elevations carry the same reproductive significance.

The American Society for Reproductive Medicine notes that evidence linking

subclinical hypothyroidism to infertility and pregnancy outcomes is mixed, particularly at lower TSH elevations. Higher TSH levels appear more concerning than borderline elevations, and thyroid peroxidase antibody status may influence risk assessment. In some contexts, especially before or during assisted reproduction, clinicians may consider levothyroxine treatment, but the decision depends on TSH level, repeat testing, antibodies, pregnancy history, and local reference ranges.

One reason this area is complex is that TSH exists on a continuum rather than as a simple on-off switch. A single mildly abnormal result can reflect laboratory variation, illness, medication effects, iodine status, or transient thyroiditis. Many clinicians confirm abnormal results before making long-term decisions, particularly if free T4 is normal and symptoms are absent.

If you have been told your TSH is "slightly high," it is reasonable to ask what threshold your clinician is using, whether pregnancy-specific targets apply, whether thyroid antibodies were checked, and whether repeat testing is appropriate. Avoid starting supplements or thyroid hormone without medical guidance, as excessive thyroid hormone can create its own fertility and pregnancy risks.

Hyperthyroidism: overactive thyroid and reproductive health

Hyperthyroidism occurs when thyroid hormone levels are too high. Causes include Graves’ disease, toxic nodular thyroid disease, thyroiditis, or excessive thyroid hormone intake. Laboratory findings often include suppressed TSH and elevated free T4 and/or T3, although early or subclinical cases may show only low TSH.

Overactive thyroid function can disturb menstrual cycles and ovulation. Some people experience lighter or infrequent periods, while others notice palpitations, heat intolerance, tremor, anxiety, unintentional weight loss, increased bowel frequency, sleep disruption, or muscle weakness. In Graves’ disease, thyroid-stimulating immunoglobulins may also be clinically relevant before and during pregnancy.

Uncontrolled hyperthyroidism during pregnancy can pose risks to both the pregnant person and fetus, so preconception planning is particularly important.

Treatment options for hyperthyroidism vary and may include antithyroid medication, radioactive iodine before pregnancy, or surgery in selected cases. Each approach has timing implications for conception, and some treatments are not compatible with active pregnancy attempts.

If hyperthyroidism is suspected, prompt medical evaluation is important. Do not delay care if symptoms include persistent rapid heart rate, chest pain, severe weakness, fever, confusion, or marked agitation, as severe thyrotoxicosis can become urgent.

Thyroid autoimmunity, implantation, and miscarriage risk

Autoimmune thyroid disease is a common cause of thyroid dysfunction. Hashimoto’s thyroiditis is associated with hypothyroidism, while Graves’ disease is associated with hyperthyroidism. Thyroid peroxidase antibodies, often called TPO antibodies, may be present even when TSH and free T4 are within the reference range.

Research has linked thyroid autoimmunity with subfertility, miscarriage, and adverse pregnancy outcomes, but causality and best management are not always straightforward. Antibody positivity may be a marker of a broader immune environment, a tendency toward future thyroid dysfunction, or subtle thyroid hormone insufficiency under the increased demands of early pregnancy. Some studies suggest worse outcomes in antibody-positive individuals, while treatment benefit in euthyroid antibody-positive patients remains debated.

For people with recurrent pregnancy loss, unexplained infertility, or planned assisted reproduction, clinicians may evaluate thyroid antibodies alongside TSH and free T4. If antibodies are present, monitoring may be closer, even when immediate treatment is not recommended. This can be emotionally difficult: an antibody result may feel like an answer, but it may not translate into a simple intervention. A good fertility team can help place the result in context rather than treating it as a standalone diagnosis.

Thyroid testing during infertility evaluation

Thyroid testing is commonly included in infertility evaluation because the tests are accessible and the findings can change preconception planning.

Typical blood tests may include TSH as the initial screen, free T4 to assess circulating thyroid hormone, and TPO antibodies when autoimmune thyroid disease is suspected or when risk stratification is needed. In suspected hyperthyroidism, free T3 and TSH receptor antibodies may also be considered.

Testing is particularly relevant if there are irregular cycles, anovulation, recurrent miscarriage, known thyroid disease, goiter, autoimmune disease, prior thyroid surgery or radioactive iodine treatment, use of medications affecting thyroid function, or a strong family history. People pursuing IVF or other assisted reproductive technologies may also have thyroid evaluation as part of clinic protocols.

Useful questions to bring to a fertility or endocrine appointment include:

What are my TSH and free T4 values, and were pregnancy-specific reference ranges used?
Should thyroid peroxidase antibodies or TSH receptor antibodies be checked in my situation?
If I already take levothyroxine, what should I do as soon as pregnancy is confirmed?
Could any of my medications, supplements, iodine intake, or biotin use affect my thyroid tests?
How often should thyroid function be monitored while trying to conceive or during fertility treatment?

Assisted reproduction and thyroid status

Thyroid function may matter in assisted reproduction because ovarian stimulation, high estrogen levels, and early pregnancy can increase thyroid hormone-binding proteins and alter thyroid hormone requirements. In someone with limited thyroid reserve, such as Hashimoto’s thyroiditis, TSH may rise during treatment or early gestation.

Studies and guidelines suggest that overt thyroid disease should be treated before assisted reproduction whenever possible. For subclinical hypothyroidism, especially at higher TSH levels or with positive antibodies, treatment may be considered by clinicians to reduce risk, although the strength of evidence varies. In euthyroid patients with thyroid antibodies, routine levothyroxine

for everyone is not universally supported; decisions are individualized.

If you are undergoing intrauterine insemination, IVF, ICSI, donor egg treatment, or frozen embryo transfer, ask whether your clinic has a thyroid monitoring protocol. This is especially relevant if your cycles are medicated, if you have a history of miscarriage, or if prior testing showed borderline TSH. The goal is not to chase perfect numbers, but to maintain thyroid status in a range considered safe for conception and early pregnancy.

Preparing for pregnancy with a thyroid disorder

Preconception planning can reduce uncertainty. If you have known thyroid disease, schedule a review before trying to conceive or before starting fertility treatment. Bring recent laboratory results, medication doses, supplement lists, and prior pregnancy history. If you take levothyroxine, discuss how to take it consistently, because absorption can be affected by iron, calcium, prenatal vitamins, some antacids, and timing with meals.

People treated for hyperthyroidism should discuss conception timing carefully. Some antithyroid drugs have trimester-specific considerations, and radioactive iodine treatment requires delaying pregnancy for a period determined by the treating specialist. Graves’ disease antibodies may need monitoring because they can affect fetal thyroid function even after definitive treatment.

It is also helpful to view thyroid care as part of whole-person fertility support. Cycle tracking, evaluation for PCOS when ovulation is irregular, assessment of ovarian reserve when age or treatment planning is relevant, semen analysis, and uterine or tubal evaluation may all be appropriate depending on the situation. Thyroid optimization can be valuable, but it should not delay a broader fertility workup when indicated.

Emotional impact and shared decision-making

Thyroid-related fertility concerns can be emotionally heavy because they often sit in a gray zone: a value is "borderline," antibodies are "positive," or treatment is "optional." It is understandable to want a clear cause and a clear fix. At the same time, fertility outcomes are probabilistic, and thyroid markers rarely explain everything by themselves.

Shared decision-making is especially important when evidence is mixed. A clinician can help weigh potential benefits, uncertainties, side effects, monitoring burden, cost, pregnancy plans, and your personal history. If you feel dismissed or confused, seeking a second opinion from a reproductive endocrinologist or endocrinologist is reasonable.

Most importantly, a thyroid finding should not be interpreted as personal failure. It is a medical variable to understand and manage. Many people with thyroid disorders conceive and have healthy pregnancies with appropriate monitoring and individualized care.