The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

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# Thyroid Disease in Pregnancy

*Uncontrolled thyrotoxicosis and hypothyroidism are associated with adverse pregnancy outcomes. There also is concern about the effect of overt maternal thyroid disease and even subclinical maternal thyroid disease on fetal development. In addition, medications that affect the maternal thyroid gland can cross the placenta and affect the fetal thyroid gland. This document reviews the thyroid-related pathophysiologic changes that occur during pregnancy and the effects of overt and subclinical maternal thyroid disease on maternal and fetal outcomes.*

## Background

### Changes in Thyroid Function During Pregnancy

Physiologic thyroid changes during pregnancy are considerable and may be confused with maternal thyroid abnormalities. Maternal thyroid volume is 30% larger in the third trimester than in the first trimester (1). In addition, there are changes to thyroid hormone levels and thyroid function throughout pregnancy. Table 1 depicts how thyroid function test results change in normal pregnancy and in overt and subclinical thyroid disease. First, maternal total or bound thyroid hormone levels increase with serum concentration of thyroid-binding globulin. Second, the level of thyrotropin (also known as thyroid-stimulating hormone [TSH]), which plays a central role in screening for and diagnosis of many thyroid disorders, decreases in early pregnancy because of weak stimulation of TSH receptors caused by substantial quantities of human chorionic gonadotropin (hCG) during the first 12 weeks of gestation. Thyroid hormone secretion is thus stimulated, and the resulting increased serum free thyroxine ($T_4$) levels suppress hypothalamic thyrotropin-releasing hormone, which in turn limits pituitary TSH secretion. After the first trimester, TSH levels return to baseline values and progressively increase in the third trimester related to placental growth and production of placental deiodinase (2). These physiologic changes should be considered when interpreting thyroid function test results during pregnancy (Table 1).

**Table 1. Changes in Thyroid Function Test Results in Normal Pregnancy and in Thyroid Disease** ⇦

| Maternal Status | TSH | Free $T_4$ |
|---|---|---|
| Pregnancy | Varies by trimester* | No change |
| Overt hyperthyroidism | Decrease | Increase |
| Subclinical hyperthyroidism | Decrease | No change |
| Overt hypothyroidism | Increase | Decrease |
| Subclinical hypothyroidism | Increase | No change |

Abbreviations: $T_4$, thyroxine; TSH, thyroid-stimulating hormone.

*The level of TSH decreases in early pregnancy because of weak TSH receptor stimulation due to substantial quantities of human chorionic gonadotropin during the first 12 weeks of gestation. After the first trimester, TSH levels return to baseline values.

**Committee on Practice Bulletins—Obstetrics.** This Practice Bulletin was developed by the Committee on Practice Bulletins—Obstetrics with the assistance of Brian M. Casey, MD. The information is designed to aid practitioners in making decisions about appropriate obstetric and gynecologic care. These guidelines should not be construed as dictating an exclusive course of treatment or procedure. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to the institution or type of practice.

## Thyroid Function and the Fetus

Maternal $T_4$ is transferred to the fetus throughout the entire pregnancy and is important for normal fetal brain development. It is especially important before the fetal thyroid gland begins concentrating iodine and synthesizing thyroid hormone at approximately 12 weeks of gestation (3, 4).

## Hyperthyroidism

Hyperthyroidism is characterized by a decreased TSH level and an increased free $T_4$ level (Table 1). Hyperthyroidism occurs in 0.2% of pregnancies; Graves disease accounts for 95% of these cases (5). The signs and symptoms of hyperthyroidism include nervousness, tremors, tachycardia, frequent stools, excessive sweating, heat intolerance, weight loss, goiter, insomnia, palpitations, and hypertension. Distinctive symptoms of Graves disease are ophthalmopathy (signs include lid lag and lid retraction) and dermopathy (signs include localized or pretibial myxedema). Although some symptoms of hyperthyroidism are similar to normal symptoms of pregnancy or some non-thyroid-associated diseases, the results of serum thyroid function tests differentiate thyroid disease from these other possibilities. Inadequately treated maternal thyrotoxicosis is associated with a greater risk of severe preeclampsia and maternal heart failure than treated, controlled maternal thyrotoxicosis (6, 7).

### Fetal and Neonatal Effects

Inadequately treated hyperthyroidism is associated with an increase in medically indicated preterm deliveries, low birth weight, and possibly fetal loss (6–8). In most cases of maternal hyperthyroidism, the neonate is euthyroid. Fetal and neonatal risks associated with Graves disease are related either to the disease itself or to thioamide treatment of the disease.

Because a large proportion of thyroid disease in women is mediated by antibodies that cross the placenta, there is a legitimate concern about the risk of development of immune-mediated hypothyroidism and hyperthyroidism in the neonate. Pregnant women with Graves disease can have thyroid-stimulating immunoglobulin and TSH-binding inhibitory immunoglobulins, also known as thyrotropin-binding inhibitory immunoglobulins, that can stimulate or inhibit the fetal thyroid, respectively. In some cases, maternal TSH-binding inhibitory immunoglobulins may cause transient hypothyroidism in neonates of women with Graves disease (9, 10). Also, 1–5% of these neonates have hyperthyroidism or neonatal Graves disease caused by the transplacental passage of maternal thyroid-stimulating immunoglobulin (11). The incidence is low because of the balance of stimulatory and inhibitory antibodies as well as thioamide treatment (12). In neonates, maternal antibodies are cleared less rapidly than thioamides, which sometimes results in delayed presentation of neonatal Graves disease (12). The incidence of neonatal Graves disease is unrelated to maternal thyroid function. The neonates of women with Graves disease who have been treated surgically or with radioactive iodine-131 before pregnancy and whose mothers required no thioamide treatment are at higher risk of neonatal Graves disease because they lack suppressive thioamide (12).

The possibility of fetal thyrotoxicosis should be considered in all women with a history of Graves disease (5). If fetal thyrotoxicosis is diagnosed, consultation with a clinician with expertise in such conditions is warranted.

### Fetal Evaluation

Routine evaluation of fetal thyroid function, including fetal thyroid ultrasonographic assessment, umbilical cord blood sampling, or both, is not recommended (13, 14). However, because maternal hyperthyroidism can be associated with fetal hydrops, growth restriction, goiter, or tachycardia, fetal thyroid disease should be considered in the differential diagnosis in these cases, and consultation with an expert may be appropriate (15). The Endocrine Society's Clinical Practice Guidelines recommend umbilical cord blood sampling only when the diagnosis of fetal thyroid disease cannot be reasonably excluded based on clinical and ultrasonographic data (16).

## Subclinical Hyperthyroidism

Subclinical hyperthyroidism has been reported in 1.7% of pregnant women (17) and is characterized by an abnormally low serum TSH concentration with free $T_4$ levels within the normal reference range (18) (Table 1). Importantly, it has not been associated with adverse pregnancy outcomes (17, 19, 20). Because antithyroid medication crosses the placenta and could theoretically have adverse fetal or neonatal effects, treatment of pregnant women with subclinical hyperthyroidism is not warranted.

## Hypothyroidism

Overt hypothyroidism complicates 2–10 per 1,000 pregnancies (17). It is characterized by an increased level of TSH, a decreased level of free $T_4$ (Table 1), and nonspecific clinical findings that may be indistinguishable from common signs or symptoms of pregnancy, such as fatigue, constipation, cold intolerance, muscle cramps, and weight gain. Other clinical findings include edema, dry skin, hair loss, and a prolonged relaxation phase of

deep tendon reflexes. Goiter may or may not be present in cases of hypothyroidism and is more likely to occur in women who have Hashimoto thyroiditis (also known as Hashimoto disease) or who live in areas of endemic iodine deficiency. Hashimoto thyroiditis is the most common cause of hypothyroidism in pregnancy and is characterized by glandular destruction by autoantibodies, particularly antithyroid peroxidase antibodies.

Adequate maternal iodine intake is needed for the maternal and fetal synthesis of $T_4$. Women of reproductive age should assess their diets and dietary supplements to confirm that they are meeting the recommended daily dietary intake of 150 micrograms of iodine. The recommended daily dietary intake of iodine is 220 micrograms for pregnant women and 290 micrograms for lactating women (21). It should be noted that iodine is not always included in supplemental multivitamins, including prenatal vitamins.

Adverse perinatal outcomes such as spontaneous abortion, preeclampsia, preterm birth, abruptio placentae, and fetal death are associated with untreated overt hypothyroidism (17, 22). Adequate thyroid hormone replacement therapy during pregnancy in women with overt hypothyroidism minimizes the risk of adverse outcomes (23).

### Fetal and Neonatal Effects

Overt, untreated maternal hypothyroidism has been associated with an increased risk of low birth weight and impaired neuropsychologic development of the offspring (17, 22). However, it is rare for maternal thyroid inhibitory antibodies to cross the placenta and cause fetal hypothyroidism. The prevalence of fetal hypothyroidism in the offspring of women with Hashimoto thyroiditis is estimated to be only 1 in 180,000 neonates (24).

## *Subclinical Hypothyroidism*

*Subclinical hypothyroidism* is defined as an elevated serum TSH level in the presence of a normal free $T_4$ level (18) (Table 1). The prevalence of subclinical hypothyroidism in pregnancy has been estimated to be 2–5% (25–27). Subclinical hypothyroidism is unlikely to progress to overt hypothyroidism during pregnancy in otherwise healthy women.

Interest in subclinical hypothyroidism in pregnancy was heightened by two observational studies published in 1999 that suggested that undiagnosed maternal thyroid hypofunction might be associated with impaired neurodevelopment in offspring (28, 29). However, a large randomized controlled trial published in 2012, the Controlled Antenatal Thyroid Screening Study, demonstrated no difference in neurocognitive development in offspring of women who were screened and treated for subclinical hypothyroidism (30). In some studies, maternal subclinical hypothyroidism also has been shown to be associated with higher incidences of preterm birth, abruptio placentae, admission of infants to the intensive care nursery, severe preeclampsia, and gestational diabetes (19, 20, 25). However, other studies have not identified a link between maternal subclinical hypothyroidism and these adverse obstetric outcomes (26, 31). Currently, there is no evidence that identification and treatment of subclinical hypothyroidism during pregnancy improves these outcomes (30).

# Clinical Considerations and Recommendations

### ▶ *Which pregnant patients should be screened for thyroid disease?*

Universal screening for thyroid disease in pregnancy is not recommended because identification and treatment of maternal subclinical hypothyroidism has not been shown to result in improved neurocognitive function in offspring. Indicated testing of thyroid function should be performed in women with a personal history of thyroid disease or symptoms of thyroid disease. The performance of thyroid function studies in asymptomatic pregnant women who have a mildly enlarged thyroid is not warranted because up to a 30% enlargement of the thyroid gland is typical during pregnancy (1). In a pregnant woman with a significant goiter or with distinct nodules, thyroid function studies are appropriate, as they would be outside of pregnancy.

Universal prenatal screening to identify subclinical hypothyroidism was previously recommended by some professional organizations (32) based on findings from two observational studies that suggested that maternal subclinical hypothyroidism may be associated with adverse neurocognitive outcomes in offspring (28, 29). However, the results of the Controlled Antenatal Thyroid Screening Study demonstrated that screening and treatment of women with subclinical hypothyroidism during pregnancy did not improve the cognitive function of their children at age 3 years (30). Therefore, the American College of Obstetricians and Gynecologists, the Endocrine Society, and the American Association of Clinical Endocrinologists recommend against universal screening for thyroid disease in pregnancy and recommend testing during pregnancy only for those who are at increased risk of overt hypothyroidism (16, 33, 34).

### ▶ *What laboratory tests are used to diagnose thyroid disease during pregnancy?*

Levels of TSH and free $T_4$ should be measured to diagnose thyroid disease in pregnancy. The first-line screening test used to assess thyroid status in patients is measurement of the TSH level. Assuming normal hypothalamic–pituitary function, an inverse log-linear relationship exists between serum TSH and serum thyroid hormone, such that small alterations in circulating hormone levels will produce much larger changes in TSH. Furthermore, because the free hormone assays used by most clinical laboratories do not use physical separation techniques such as equilibrium dialysis, test results depend on individual binding protein levels and represent only estimates of actual circulating free $T_4$ concentrations. Therefore, TSH is the most reliable indicator of thyroid status because it indirectly reflects thyroid hormone levels as sensed by the pituitary gland. The following trimester-specific reference ranges for TSH are recommended by the American Thyroid Association: first trimester, 0.1–2.5 mIU/L; second trimester, 0.2–3.0 mIU/L; third trimester, 0.3–3.0 mIU/L (33). When the TSH level is abnormally high or low, a follow-up study to measure the free $T_4$ level should be performed.

A low TSH level and a high free $T_4$ level are characteristic of overt hyperthyroidism, whereas a high TSH level and a low free $T_4$ level are characteristic of overt hypothyroidism. Rarely, symptomatic hyperthyroidism is caused by abnormally high free triiodothyronine ($T_3$) levels—so-called $T_3$ toxicosis. Thus, if there is strong reason to believe that an individual is overtly hyperthyroid (eg, because of clinical signs) and TSH is low but free $T_4$ is normal, the free $T_3$ level should be measured as well.

Measurement of antithyroid antibodies in situations of overt thyroid disease, even in cases of subclinical thyroid dysfunction, has been proposed. Some have suggested that the measurable antithyroid peroxidase or antithyroglobulin antibodies that are sometimes present in euthyroid women may have clinical relevance. However, the results of such testing rarely lead to changes in management of women who are euthyroid or women with thyroid disease, and there currently is no evidence to support routine testing of these antibodies.

### ▶ *What medications should be used to treat overt hyperthyroidism in pregnancy, and how should they be administered and adjusted during pregnancy?*

Pregnant women with overt hyperthyroidism should be treated with a thioamide to minimize the risk of adverse outcomes. Either propylthiouracil or methimazole, both thioamides, can be used to treat pregnant women with overt hyperthyroidism. Historically, propylthiouracil was the preferred treatment for hyperthyroidism in pregnancy because it partially inhibits the conversion of $T_4$ to $T_3$ and crosses the placenta less readily than methimazole (35). In addition, methimazole has been associated with a rare embryopathy characterized by esophageal or choanal atresia as well as aplasia cutis, a congenital skin defect (36). Among the more than 5,000 Japanese women in whom first-trimester hyperthyroidism was diagnosed, a twofold increased risk of major fetal malformations was reported in those who were exposed to methimazole compared with those exposed to propylthiouracil (36). Specifically, seven of nine cases of aplasia cutis and the only case of esophageal atresia occurred in methimazole-exposed infants.

In 2009, the U.S. Food and Drug Administration (FDA) issued a safety alert on propylthiouracil-associated hepatotoxicity. This alert was based on 32 reports of propylthiouracil liver toxicity in the FDA's adverse event reporting system compared with five reports of liver toxicity for methimazole during a period when propylthiouracil was the preferred therapy for hyperthyroidism in the United States. The FDA safety alert suggested that propylthiouracil may be appropriate for patients with hyperthyroidism who are in their first trimester of pregnancy. Correspondingly, the American Thyroid Association and the American Association of Clinical Endocrinologists have recommended propylthiouracil therapy during the first trimester followed by a switch to methimazole beginning in the second trimester (37). This change in medications during pregnancy endeavors to balance the risk of two rare events: 1) hepatotoxicity and 2) methimazole embryopathy.

Transient leukopenia occurs in up to 10% of pregnant women who take thioamide drugs, but this does not require therapy cessation. In less than 1% of patients who take thioamide drugs, however, agranulocytosis develops suddenly and mandates discontinuation of the drug. The development of agranulocytosis is not related to dosage, and because of its acute onset, serial leukocyte counts during therapy are not helpful. Thus, if fever or sore throat develops, women are instructed to discontinue use of the medication immediately and report for a complete blood count (35). Hepatotoxicity is a potentially serious adverse effect that develops in 0.1–0.2% of pregnant women treated with propylthiouracil. However, routine measurement of hepatic function is not warranted in asymptomatic individuals.

The initial thioamide dose is empirical. If propylthiouracil is selected, a dose of 50–150 mg orally three

times daily may be initiated, depending on clinical severity (37). If methimazole is used, an initial daily dose of 10–40 mg orally, divided into two or three doses, is recommended (although the frequency may be reduced to a daily dose as maintenance therapy is established). The goal is treatment with the lowest possible thioamide dose to maintain free $T_4$ levels slightly above or in the high-normal range, regardless of TSH levels (37). The level of free $T_4$ should be monitored in pregnant women being treated for hyperthyroidism, and the dose of thioamide should be adjusted accordingly. Serum free $T_4$ concentrations (not TSH levels) are measured every 2–4 weeks after initiation of therapy, and the thioamide dose should be adjusted accordingly (37).

### ▶ *What medications should be used to treat overt hypothyroidism in pregnancy, and how should they be administered and adjusted during pregnancy?*

Pregnant women with overt hypothyroidism should be treated with adequate thyroid hormone replacement to minimize the risk of adverse outcomes. For the treatment of overt hypothyroidism in pregnancy, the American Thyroid Association and the American Association of Clinical Endocrinologists recommend $T_4$ replacement therapy, beginning with levothyroxine in dosages of 1–2 micrograms/kg daily or approximately 100 micrograms daily (17, 34). Pregnant women who have no thyroid function after thyroidectomy or radioiodine therapy may require higher dosages. Unlike in pregnant women with hyperthyroidism, assessment of therapy in pregnant women with hypothyroidism is guided by measurement of TSH levels rather than free $T_4$ levels. The level of TSH should be monitored in pregnant women being treated for hypothyroidism, and the dose of levothyroxine should be adjusted accordingly. Thyroid-stimulating hormone levels should be measured at 4-week to 6-week intervals, and the levothyroxine dose adjusted by 25-microgram to 50-microgram increments until TSH values become normal.

Pregnancy is associated with an increased $T_4$ requirement in approximately one third of supplemented women (38, 39). This increased demand is believed to be related to increased estrogen production (40). Significant hypothyroidism may develop early in women without thyroid reserve, such as those with a previous thyroidectomy or prior radioiodine ablation (39, 41, 42). Anticipatory 25% increases in $T_4$ replacement at pregnancy confirmation will reduce this likelihood. All other women with hypothyroidism should undergo TSH testing at initiation of prenatal care.

### ▶ *What changes in thyroid function occur with hyperemesis gravidarum, and should thyroid function tests be performed routinely in women with hyperemesis?*

Transient biochemical features of hyperthyroidism may be observed in 2–15% of women in early pregnancy (27). Many women with hyperemesis gravidarum have abnormally high serum $T_4$ levels and low TSH levels. In a 2014 systematic review of markers for hyperemesis gravidarum, two thirds of 34 published studies that analyzed thyroid function revealed a decreased TSH level or an increased free $T_4$ level in symptomatic women when compared with those without symptoms of hyperemesis (43). These thyroid function abnormalities result from TSH receptor stimulation from high concentrations of hCG.

This physiologic hyperthyroidism also is known as gestational transient hyperthyroidism and also may be associated with a multiple gestation or a molar pregnancy. Women with gestational transient hyperthyroidism are rarely symptomatic, and treatment with thioamide drugs has not been shown to be beneficial (17) and, therefore, is not recommended. Furthermore, gestational transient hyperthyroidism has not been associated with poor pregnancy outcomes. Expectant management of women with hyperemesis gravidarum and abnormal thyroid function test results usually leads to a decrease in serum free $T_4$ levels in parallel with a decrease in hCG levels after the first trimester. However, levels of TSH may remain suppressed for several weeks after free $T_4$ returns to normal levels (27). Therefore, routine measurements of thyroid function are not recommended in patients with hyperemesis gravidarum unless other signs of overt hyperthyroidism are evident.

### ▶ *How are thyroid storm and thyrotoxic heart failure diagnosed and treated in pregnancy?*

Thyroid storm and thyrotoxic heart failure are acute and life-threatening conditions in pregnancy. Thyroid storm is rare, occurring in 1–2% of pregnant patients with hyperthyroidism, but has a high risk of maternal heart failure (44). It is a hypermetabolic state caused by an excess of thyroid hormone and is diagnosed by a combination of the following signs and symptoms: fever, tachycardia, cardiac dysrhythmia, and central nervous system dysfunction. Thyroid storm develops abruptly and affects the body's thermoregulatory, cardiovascular, nervous, and gastrointestinal systems, which leads to multiorgan decompensation.

Heart failure and pulmonary hypertension from cardiomyopathy caused by the myocardial effects of

excessive $T_4$ are more common in pregnancy than thyroid storm and have been identified in 8% of pregnant women with uncontrolled hyperthyroidism (44–46). Decompensation usually is precipitated by preeclampsia, anemia, sepsis, or a combination of these conditions. Frequently, $T_4$-induced cardiomyopathy and pulmonary hypertension are reversible (44, 47, 48).

If thyroid storm or thyrotoxic heart failure is suspected, serum free $T_4$ and TSH levels should be evaluated to help confirm the diagnosis, but therapy should not be withheld pending the results. Treatment is similar for thyroid storm and thyrotoxic heart failure in pregnancy and should be carried out in an intensive care area that may include special-care units within a labor and delivery unit (Box 1).

Coincident with treating thyroid storm, the perceived underlying cause also should be treated. It is also important to note that even if fetal status is not reassuring in the acute setting of thyroid storm, that status may improve as maternal status is stabilized. In general, it is prudent to avoid delivery in the presence of thyroid storm.

**Box 1. Medical Management of Thyroid Storm or Thyrotoxic Heart Failure in Pregnancy**

- Inhibit thyroid release of $T_3$ and $T_4$
  - Propylthiouracil, 1,000 mg PO load, then 200 mg PO every 6 hours
  - Iodine administration 1–2 hours after propylthiouracil by
    - –sodium iodide, 500–1,000 mg IV every 8 hours
    - or
    - –potassium iodide, five drops PO every 8 hours
    - or
    - –lugol solution, 10 drops PO every 8 hours
    - or
    - –lithium carbonate (if patient has an iodine anaphylaxis history), 300 mg PO every 6 hours
- Further block peripheral conversion of $T_4$ to $T_3$
  - Dexamethasone, 2 mg IV every 6 hours for four doses
  - or
  - Hydrocortisone, 100 mg IV every 8 hours for three doses
- If a β-blocking drug is given to control tachycardia, its effect on heart failure also must be considered.
  - Propranolol, labetalol, and esmolol all have been used successfully.
- Supportive measures, such as temperature control, as needed

Abbreviations: IV, intravenous; PO, per os; $T_3$, triiodothyronine; $T_4$, thyroxine.

### *How should a thyroid nodule or thyroid cancer during pregnancy be assessed?*

Thyroid nodules are found in 1–2% of reproductive-aged women (27). Management of a palpable thyroid nodule during pregnancy depends on risk stratification that includes factors such as gestational age and size of the mass. Thus, a pregnant woman with a thyroid nodule should have the following examinations and tests: a complete history and physical examination, serum TSH testing, and ultrasound of the neck. Ultrasonographic examination reliably detects nodules larger than 0.5 cm. Ultrasonographic characteristics associated with malignancy include hypoechoic pattern, irregular margins, and microcalcifications (49). If ultrasound test results are suspicious for malignancy, fine-needle aspiration is an excellent assessment method, and histologic tumor markers and immunostaining are reliable to evaluate for malignancy (50, 51). Radioiodine scanning in pregnancy is not recommended because of the theoretic risk associated with fetal irradiation. However, if there has been inadvertent administration of radioiodine before 12 weeks of gestation, the American Thyroid Association has noted that the fetal thyroid gland, which does not become significantly functionally active until approximately 12 weeks of gestation, does not appear to be at risk of damage (33).

Evaluation of thyroid cancer in pregnancy involves a multidisciplinary approach. Most cases of thyroid carcinoma are well differentiated and follow an indolent course. The possibility that thyroid cancer is part of a hereditary familial cancer syndrome is unlikely but should be considered. When thyroid malignancy is diagnosed during the first trimester or second trimester, thyroidectomy may be performed before the third trimester, but concern regarding inadvertent removal of parathyroid glands often leads to the choice to delay surgery until after delivery. In women without evidence of an aggressive thyroid cancer or those in whom thyroid cancer is diagnosed in the third trimester, surgical treatment can be deferred to the immediate postpartum period (49).

### *How is postpartum thyroiditis diagnosed and treated?*

*Postpartum thyroiditis* is defined as thyroid dysfunction within 12 months of delivery that can include clinical

evidence of hyperthyroidism, hypothyroidism, or both. Transient autoimmune thyroiditis is found in approximately 5–10% of women during the first year after childbirth (33, 52, 53). In clinical practice, postpartum thyroiditis is diagnosed infrequently because it typically develops months after delivery and causes vague and nonspecific symptoms that often are attributed to the stresses of motherhood (54).

The clinical presentation of postpartum thyroiditis varies. Classically, there are two recognized clinical phases that may develop in succession. New-onset abnormal levels of TSH and free $T_4$ confirm the diagnosis of either phase. Typically, the first phase is characterized by destruction-induced thyrotoxicosis, with symptoms caused by excessive release of thyroid hormone from glandular disruption. The onset is abrupt, and a small, painless goiter commonly is found. Postpartum thyroiditis may give rise to hypothyroid symptoms of fatigue, constipation, or depression, or to hyperthyroid symptoms of fatigue, irritability, weight loss, palpitations, or heat intolerance (55). The thyrotoxic phase usually lasts only a few months. Treatment with thioamides generally is ineffective, but if symptoms are severe enough, a β-blocking drug may be helpful. The usual second phase is overt hypothyroidism that occurs between 4 months and 8 months postpartum. Thyromegaly and other symptoms of hypothyroidism are common and more prominent than during the thyrotoxic phase. The recommended treatment is $T_4$ replacement therapy with levothyroxine (25–75 micrograms/d) for 6–12 months.

In most women with postpartum thyroiditis, the condition will resolve spontaneously. Nevertheless, approximately one third of women with either type of postpartum thyroiditis eventually develop permanent, overt hypothyroidism (55–57). These women should be managed in collaboration with the appropriate specialist. The risk of postpartum thyroiditis and the risk of permanent hypothyroidism are increased in women with thyroid antibodies.

### ▶ *Is there a role for screening or testing for thyroid autoantibodies in pregnancy?*

Few studies demonstrate benefits from the identification and treatment of euthyroid pregnant women who have thyroid autoantibodies. Thus, universal screening for thyroid autoantibodies in pregnancy currently is not recommended by the American College of Obstetricians and Gynecologists, the Endocrine Society, the American Association of Clinical Endocrinologists, or the American Thyroid Association (16, 33, 34, 53).

# Summary of Recommendations

***The following recommendations are based on good and consistent scientific evidence (Level A):***

- Universal screening for thyroid disease in pregnancy is not recommended because identification and treatment of maternal subclinical hypothyroidism has not been shown to result in improved neurocognitive function in offspring.
- The first-line screening test used to assess thyroid status in patients is measurement of the TSH level.
- Levels of TSH and free $T_4$ should be measured to diagnose thyroid disease in pregnancy.
- Pregnant women with overt hypothyroidism should be treated with adequate thyroid hormone replacement to minimize the risk of adverse outcomes.
- The level of TSH should be monitored in pregnant women being treated for hypothyroidism, and the dose of levothyroxine should be adjusted accordingly.
- Pregnant women with overt hyperthyroidism should be treated with a thioamide to minimize the risk of adverse outcomes.
- The level of free $T_4$ should be monitored in pregnant women being treated for hyperthyroidism, and the dose of thioamide should be adjusted accordingly.

***The following recommendation is based on limited or inconsistent scientific evidence (Level B):***

- Either propylthiouracil or methimazole, both thioamides, can be used to treat pregnant women with overt hyperthyroidism.

***The following recommendations are based primarily on consensus and expert opinion (Level C):***

- Routine measurements of thyroid function are not recommended in patients with hyperemesis gravidarum unless other signs of overt hyperthyroidism are evident.
- Indicated testing of thyroid function should be performed in women with a personal history of thyroid disease or symptoms of thyroid disease.

# Proposed Performance Measure

Percentage of women without risk factors for thyroid disease during pregnancy who are nevertheless screened for thyroid disease

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The MEDLINE database, the Cochrane Library, and the American College of Obstetricians and Gynecologists' own internal resources and documents were used to conduct a literature search to locate relevant articles published between January 2000–February 2014. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research, although review articles and commentaries also were consulted. Abstracts of research presented at symposia and scientific conferences were not considered adequate for inclusion in this document. Guidelines published by organizations or institutions such as the National Institutes of Health and the American College of Obstetricians and Gynecologists were reviewed, and additional studies were located by reviewing bibliographies of identified articles. When reliable research was not available, expert opinions from obstetrician–gynecologists were used.

Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force:

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| I | Evidence obtained from at least one properly designed randomized controlled trial. |
| II-1 | Evidence obtained from well-designed controlled trials without randomization. |
| II-2 | Evidence obtained from well-designed cohort or case–control analytic studies, preferably from more than one center or research group. |
| II-3 | Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence. |
| III | Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees. |

Based on the highest level of evidence found in the data, recommendations are provided and graded according to the following categories:

Level A—Recommendations are based on good and consistent scientific evidence.

Level B—Recommendations are based on limited or inconsistent scientific evidence.

Level C—Recommendations are based primarily on consensus and expert opinion.



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