



Thyroid Function and Screening



When your child needs a hospital, everything matters.SM

Thyroid Dysfunction in Children: When and How to Test

Children may develop thyroid problems at different stages of life. Possible diagnoses include congenital hypothyroidism, primary hypothyroidism, central hypothyroidism and hyperthyroidism, all of which require formal diagnostic testing and evaluation by a pediatric endocrinologist.

To determine when it is appropriate to perform testing for thyroid dysfunction in children, please refer to the following tools or consult our Physician Direct Connect Line at (614) 355-0221 or (877) 355-0221.

Pediatric Thyroid Screening

After the newborn period, testing for thyroid function will depend on the clinical context including symptoms, physical exam and family history of children presenting to the primary care office. Symptoms of hypothyroidism are often vague and nonspecific and include fatigue, depression, constipation, hair loss, dry or coarse skin or hair, irregular menses, modest weight gain (no more than 5-10 lbs.), sensitivity to cold, poor growth, goiter or memory changes.

Laboratory reference ranges should be used when evaluating thyroid screening results. Values that fall within the reference range, whether at the lower or upper ends are normal and should not be the basis for additional testing or referral. In addition, some values that fall just outside the reference range may also be normal in the clinical context.

When to evaluate thyroid function
<ul style="list-style-type: none">Poor linear growth with normal/preserved weight gainSymptoms of hypothyroidism (noted above)Chromosomal or genetic syndromes associated with thyroid dysfunction (e.g. Down Syndrome)Use of certain medications (e.g. anti-epileptic drugs, anti-psychotics, lithium)Signs of hyperthyroidism (tachycardia, hypertension, weight loss, tremors) <p><i>Note: Evaluation of thyroid function is best done about one week after an acute illness</i></p>
When NOT to evaluate thyroid function
<ul style="list-style-type: none">Obesity without other obvious signs of thyroid dysfunction; TSH may be mildly elevated in obesity (TSH < 10 µIU/mL) and does not necessarily indicate thyroid dysfunctionWithin a few days of previous results; wait at least four weeks before repeating testsDuring or shortly following an illness; “sick euthyroid” syndrome (nonthyroidal illness) may result in temporarily abnormal thyroid function tests

Testing Thyroid Function

When testing thyroid function in children, please order both a TSH and free T4 and use the laboratory’s pediatric reference ranges to determine whether they are normal. In general, we do not recommend sending a total T4 or total T3 level for an initial screen, as these may be affected by binding protein concentrations.

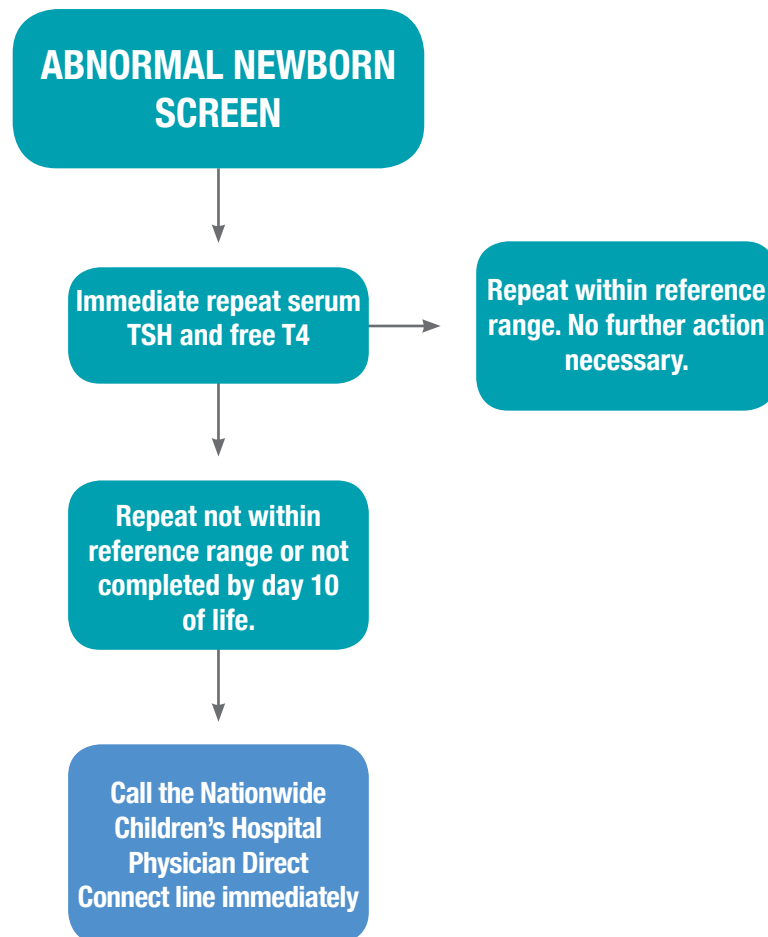
Low Free T4	
TSH low or within the reference range	<ul style="list-style-type: none">If you have concerns about linear growth, puberty, headaches or vision changes, please call the Physician Direct Connect Line and ask to speak to an endocrinologistIf there are no such concerns, wait four to six weeks and repeat TSH and free T4. The low results are typically due to recent illness or lab variation
Elevated TSH	
TSH 5-10 µIU/mL and free T4 within or above the reference range	<ul style="list-style-type: none">Wait approximately four weeks, repeat both TSH and free T4. Also obtain anti-thyroperoxidase (TPO) and anti-thyroglobulin (Tg) antibodies<ul style="list-style-type: none">If TSH and free T4 are normal and antibodies are negative, no further testing is recommendedIf TSH is elevated and free T4 is low, refer for evaluation by endocrinologyIf TSH and free T4 are normal but one or both antibodies are positive, a diagnosis of Hashimoto’s thyroiditis can be made. Recommend a non-urgent evaluation by endocrinology to discuss treatment and monitoring
TSH > 10 µIU/mL and free T4 within the reference range	<ul style="list-style-type: none">Refer for non-urgent evaluation by endocrinologyLab studies can be repeated at the time of the endocrinology evaluation
TSH > 10 µIU/mL and free T4 less than the lower limit of the reference range	<ul style="list-style-type: none">For child <3 years of age: recommend urgent evaluation by endocrinology <i>Note: Call endocrinology to discuss treatment and referral</i>For child >3 years of age: recommend evaluation by endocrinology <i>Note: Lab studies and treatment will be discussed at time of endocrinology evaluation</i>
Low TSH	
TSH < 0.5 µIU/mL and free T4 within the reference range	<ul style="list-style-type: none">Wait two to four weeks and repeat TSH and free T4. Refer if persistentTypically due to normal population variation or recent illness
TSH < 0.5 µIU/mL (typically less than assay) and free T4 above the upper limit of the reference range	<ul style="list-style-type: none">Refer for evaluation by endocrinologyIf child is symptomatic (weight loss, hypertension, palpitations, tremors) or if free T4 >3 ng/dL, please call the Physician Direct Connect Line for help with urgent evaluationIf child is asymptomatic and free T4 <3 ng/dL, evaluation is not urgent

Newborn Screening

There is a surge in TSH that occurs shortly after birth to stimulate the baby's own thyroid hormone production. The newborn TSH screen is ideal when performed after 36 hours of life, and the current reference range for term babies is TSH < 28 μ IU/mL. A screen done prior to 24 hours of life can lead to false positive results. It is important to note that the Ohio newborn screen will not identify babies born with central hypothyroidism or neonatal Graves' disease, which are rare and should be clinically recognizable.

It is important that any baby who may have congenital hypothyroidism be identified and treated within the first 10 to 14 days of life to prevent significant cognitive impairment.

What to do with an abnormal newborn screen report:



Referrals and Consultations

Online: [NationwideChildrens.org](https://www.nationwidechildrens.org)

Phone: (614) 722-6200 or (877) 722-6220 | Fax: (614) 722-4000

Physician Direct Connect Line for 24-hour urgent physician consultations: (614) 355-0221 or (877) 355-0221.

Laboratory Testing and Pathology Consultations

Online: [NationwideChildrens.org/Lab](https://www.nationwidechildrens.org/Lab)

Phone: (614) 722-5477 or (800) 934-7575