

Clinical Policy: Thyroid Hormones and Insulin Testing in Pediatrics

Reference Number: LA.CP.MP.154

Date of Last Revision: ~~02~~10/2022

Coding Implications

Revision Log

See [Important Reminder](#) at the end of this policy for important regulatory and legal information.

Description

Numerous essential metabolic functions are mitigated by hormones produced by, and affecting the thyroid, *e.g.*, thyroid stimulating hormone [TSH] and thyroxine [T4], as well as by insulin. This policy discusses the medical necessity requirements for the testing of these hormones.

Policy/Criteria

- I. It is the policy of Louisiana Healthcare Connections that thyroid hormone testing in healthy, including obese but otherwise healthy, children (age ≥ 1 and ≤ 18) is **not medically necessary** because these tests have not been demonstrated to have a clear clinical benefit.
- II. It is the policy of Louisiana Healthcare Connections that insulin testing in healthy, including obese but otherwise healthy, children (age ≥ 1 and ≤ 18) is **not medically necessary** because these tests have not been demonstrated to have a clear clinical benefit.

Background

The thyroid is an endocrine gland that regulates numerous metabolic processes through hormone secretion. -Thyroid homeostasis is controlled through a complex feedback loop through the hypothalamus-pituitary-thyroid axis. -Thyroxine (otherwise known as T4 due to the presence of four iodine molecules) is the major secretory hormone of the thyroid, and is converted into triiodothyronine (T3). -Secretion of thyroxine by the thyroid is regulated by the concentration of thyroid stimulating hormone (TSH). -TSH is generated by the pituitary gland and secreted in the bloodstream to generate a feedback loop with T4. -Loss of the regulatory feedback cycle of the thyroid hormones could lead to hyperthyroidism and primary or secondary hypothyroidism.

Assessment of thyroid function can be achieved through the quantification of thyroid hormone levels. However, the appropriate clinical utilization of these tests has been a subject of concern in the recent literature.^{1,2} For example in pediatrics, TSH and total T4 can be elevated in children who are overweight or obese, but it is not clear if this is a result or cause of obesity.^{3,4,5} Therefore general screening may not provide actionable clinical information.³⁻⁷

The Endocrine Society Clinical Practice Guideline on pediatric obesity [and the American Academy of Pediatrics](#) recommends against routine laboratory evaluations for endocrine etiologies of pediatric obesity unless the patient's stature and/or height velocity are attenuated (assessed in relationship to genetic/familial potential and pubertal stage). They also recommend against measuring insulin concentrations when evaluating children or adolescents for obesity. They note that although obesity is associated with insulin resistance/hyperinsulinemia, attempts to diagnose insulin resistance by measuring plasma insulin concentration or any other surrogate in the clinical setting has no merit because it has no diagnostic value. Fasting insulin concentrations show considerable overlap between insulin-resistant and insulin-sensitive youths. Therefore, there is no well-defined cut point differentiating normal from abnormal and no universally accepted, clinically useful, numeric expression that defines insulin resistance, unlike

for glucose or lipids. Moreover, measuring insulin is hampered by the lack of standardized insulin assays, and poor reproducibility of even the same assay. Further limitations include race/ethnicity-related differences in insulin concentrations due to differences in the metabolic clearance rate of insulin and the cross reactivity between insulin and proinsulin. In youths with Type 2 diabetes mellitus, despite severe deficiency in insulin secretion, fasting insulin concentrations are higher than in youths without diabetes. Importantly, fasting insulin concentrations are similar in youths who are obese with normal glucose tolerance vs impaired glucose tolerance, allowing for the possible danger of missing a diagnosis of impaired glucose tolerance if one uses fasting insulin concentrations as a screening tool. Because of these limitations, measuring plasma insulin concentrations remains a research tool with no clinical value for evaluation of obesity.^{7,10}

United States Preventive Services Task Force⁹

Body mass index measurement is the recommended screening test for obesity. Body mass index percentile is plotted on growth charts, such as those developed by the CDC, which are based on US-specific, population-based norms for children 2 years and older. Obesity is defined as an age- and sex-specific BMI in the 95th percentile or greater.

Coding Implications

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Table 1: CPT codes not medically necessary when billed with a corresponding ICD-10CM in Table 2

CPT® Codes	Description
83525	Insulin; total
83527	Insulin; free
84436	Thyroxine; total
84439	Thyroxine; free
84443	Thyroid stimulating hormone (TSH)
84479	Thyroid hormone (T3 or T4) uptake or thyroid hormone binding ratio (THBR)
84480	Triiodothyronine T3; total (TT-3)
84481	Triiodothyronine T3; free
84482	Triiodothyronine T3; reverse

Table 2: ICD-10-CM diagnosis codes not medically necessary when billed with a corresponding CPT code in Table 1.

ICD-10-CM Code	Description
E66.01	Morbid (severe) obesity due to excess calories
E66.09	Other obesity due to excess calories
E66.1	Drug-induced obesity
E66.3	Overweight
E66.8	Other obesity
E66.9	Obesity, unspecified
Z00.00	Encounter for general adult medical examination without abnormal findings
Z00.129	Encounter for routine child health examination without abnormal findings
Z00.8	Encounter for other general examination
Z68.52	Body mass index [BMI] pediatric, 5 th percentile to less than 85 th percentile for age
Z68.53	Body mass index [BMI] pediatric, 85 th percentile to less than 95 th percentile for age
Z68.54	Body mass index [BMI] pediatric, greater than or equal to 95 th percentile for age

Reviews, Revisions, and Approvals	Revision Date	Approval Date
Converted corporate to local policy.	08/15/2020	
Updated references and added brackets to BMI in ICD-10 codes: Z68.52-54	2/2021	
Annual review. References reviewed and updated. Specialist review. Changed "Last Review Date" in the header to "Date of Last Review" and "Date" in revision log to "Revision Date." Added "and may not support medical necessity" to coding implications.	2/22	4/14/22
<u>Annual review completed. Changed "Date of Last Review" to "Date of Last Revision" in the header. Background updated and minor rewording with no clinical significance. References reviewed and updated.</u>	<u>10/22</u>	

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Important Reminder

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