Clinical Policy: Thyroid Hormones and Insulin Testing in Pediatrics

Reference Number: LA.CP.MP.154 Coding Implications
Date of Last Revision: 10/2022 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 recommend 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.[10]

United States Preventive Services Task Force[9]
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
This clinical policy references Current Procedural Terminology (CPT®). CPT® is a registered trademark of the American Medical Association. All CPT codes and descriptions are copyrighted 2019, American Medical Association. All rights reserved. CPT codes and CPT descriptions are from the current manuals and those included herein are not intended to be all-inclusive and are included for informational purposes only. Codes referenced in this clinical policy are for informational purposes only and may not support medical necessity. Inclusion or exclusion of any codes does not guarantee coverage. Providers should reference the most up-to-date sources of professional coding guidance prior to the submission of claims for reimbursement of covered services.

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, 5th percentile to less than 85th percentile for age
Z68.53	Body mass index [BMI] pediatric, 85th percentile to less than 95th percentile for age
Z68.54	Body mass index [BMI] pediatric, greater than or equal to 95th 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
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.	10/22	1/14/23

References

1. Werhun A., Hamilton W. Thyroid function testing in primary care: overused and under-evidenced? A study examining which clinical features correspond to an abnormal thyroid function result." *Fam Pract.* 2015;32(2): 187-191. doi:10.1093/fampra/cmv010
2. Reinehr, T., Hinney, A., de Sousa, G., Austrup, F., Hebebrand, J., & Andler, W. Definable somatic disorders in overweight children and adolescents. *J Ped*. 2007;150(6), 618-622. e6225. doi:10.1016/j.jpeds.2007.01.042
3. Ghergherehchi R, Hazhir N. Thyroid hormonal status among children with obesity.*Ther Adv Endocrinol Metab. 2015;*6(2):51-55. doi:10.1177/2042018815571892
4. Longhi S, Radetti G. Thyroid function and obesity. *J. Clin Res Pediatr Endocrinol.* 2013;5.Suppl 1(Suppl 1):40-44. doi:10.4274/jcrpe.856
5. Thyroid testing is becoming more common, but is it necessary? Paul B. Kaplowitz. AAP News Mar 2013, 34(3)14; 10.1542/aapnews.2013343-14

6. Kaplowitz PB. Subclinical hypothyroidism in children: normal variation or sign of a failing thyroid gland? *Int J Pediatr Endocrinol* 2010;2010: 281453. doi:10.1155/2010/281453
7. Styne DM, Arslanian SA, Connor EL, et al. Pediatric obesity-assessment, treatment, and prevention: an endocrine society clinical practice guideline. *J Clin Endocrinol Metab*, 2017;102(3):709-757. doi: 10.1210/jc.2016-2573.
8. Skelton, JA, Klish. Clinical evaluation of the obese child and adolescent. UpToDate. www.uptodate.com Published September 28, 2020. Accessed Sept 16, 2021.
9. United States Preventive Services Task Force Recommendation Statement. Screening for obesity in children and adolescents.June 2017. https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/obesity-in-children-and-adolescents-screening Published June 20, 2017. Accessed August 15, 2022.
10. American Academy of Pediatrics. Choosing wisely: Five things physicians and patients should question. https://www.choosingwisely.org/wp-content/uploads/2017/09/AAP_SOEn-Choosing-Wisely-List.pdf. Published October 2, 2017 (last reviewed 2022). Accessed August 15, 2022.
11. Brent GA. Thyroid hormone action. UpToDate. www.uptodate.com. Updated April 27, 2022. Accessed August 15, 2022.

Important Reminder

This clinical policy has been developed by appropriately experienced and licensed health care professionals based on a review and consideration of currently available generally accepted standards of medical practice; peer-reviewed medical literature; government agency/program approval status; evidence-based guidelines and positions of leading national health professional organizations; views of physicians practicing in relevant clinical areas affected by this clinical policy; and other available clinical information. LHCC makes no representations and accepts no liability with respect to the content of any external information used or relied upon in developing this clinical policy. This clinical policy is consistent with standards of medical practice current at the time that this clinical policy was approved.

The purpose of this clinical policy is to provide a guide to medical necessity, which is a component of the guidelines used to assist in making coverage decisions and administering benefits. It does not constitute a contract or guarantee regarding payment or results. Coverage decisions and the administration of benefits are subject to all terms, conditions, exclusions and limitations of the coverage documents (e.g., evidence of coverage, certificate of coverage, policy, contract of insurance, etc.), as well as to state and federal requirements and applicable LHCC administrative policies and procedures.

This clinical policy is effective as of the date determined by LHCC. The date of posting may not be the effective date of this clinical policy. This clinical policy may be subject to applicable legal and regulatory requirements relating to provider notification. If there is a discrepancy between the effective date of this clinical policy and any applicable legal or regulatory requirement, the requirements of law and regulation shall govern. LHCC retains the right to change, amend or withdraw this clinical policy, and additional clinical policies may be developed and adopted as needed, at any time.

This clinical policy does not constitute medical advice, medical treatment or medical care. It is not intended to dictate to providers how to practice medicine. Providers are expected to exercise professional medical judgment in providing the most appropriate care, and are solely responsible for the medical advice and treatment of members/enrollees. This clinical policy is not intended to recommend treatment for members/enrollees. Members/enrollees should consult with their treating physician in connection with diagnosis and treatment decisions.

Providers referred to in this clinical policy are independent contractors who exercise independent judgment and over whom LHCC has no control or right of control. Providers are not agents or employees of LHCC.

This clinical policy is the property of LHCC. Unauthorized copying, use, and distribution of this clinical policy or any information contained herein are strictly prohibited. Providers, members/enrollees and their representatives are bound to the terms and conditions expressed herein through the terms of their contracts. Where no such contract exists, providers, members/enrollees and their representatives agree to be bound by such terms and conditions by providing services to members/enrollees and/or submitting claims for payment for such services.