MAYO CLINIC LABORATORIES

Test Definition: HIAA

5-Hydroxyindoleacetic Acid, 24 Hour, Urine

Overview

Useful For

Biochemical diagnosis and monitoring of intestinal carcinoid syndrome using 24-hour urine specimens

Special Instructions

- Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens

Method Name

Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)

NY State Available

Yes

Specimen

Specimen Type

Urine

Ordering Guidance

This test is the preferred test for measurement of 5-hydroxyindoleacetic acid concentrations. If a random urine collection is preferred, order HIAAR / 5-Hydroxyindoleacetic Acid, Random, Urine.

Necessary Information

1. Collection duration and urine volume in milliliters are required.

2. Patient's age and sex are required.

Specimen Required

Patient Preparation:

1. Some medications could interfere with test results. If medically feasible, for 48 hours before specimen collection, patient should not take the following medications:

-Acetaminophen (Tylenol or generic versions)

-Tryptophan containing supplements

2. For 48 hours prior to, as well as during, the urine collection, the patient should limit the following to one serving per day:

-Fruits

-Vegetables

-Nuts

-Caffeinated beverages or foods

Supplies: Urine Tubes, 10 mL (T068)

Container/Tube: Plastic, 10-mL urine tube
Specimen Volume: 5 mL
Collection Instructions:
1. Add 25 mL of 50% acetic acid as preservative at start of collection. Use 15 mL of 50% acetic acid for children younger than 5 years.
2. Collect a 24-hour urine specimen.
Additional Information: See Urine Preservatives-Collection and Transportation for 24-Hour Urine Specimens for multiple collections.

Forms

If not ordering electronically, complete, print, and send an Oncology Test Request (T729) with the specimen.

Urine Preservative Collection Options

Note: The addition of preservative must occur prior to beginning the collection.

Ambient (no additive)	No
Refrigerate (no additive)	OK
Frozen (no additive)	OK
50% Acetic Acid	Preferred
Boric Acid	OK
Diazolidinyl Urea	No
6M Hydrochloric Acid	OK
6M Nitric Acid	OK
Sodium Carbonate	OK
Toluene	OK

Specimen Minimum Volume

1 mL

Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Urine	Refrigerated (preferred)	56 days	
	Frozen	365 days	

Clinical & Interpretive

Clinical Information

5-Hydroxyindoleacetic acid (5-HIAA) is the major metabolite of serotonin and is excreted in the urine. Intestinal carcinoid tumors, along with neuroendocrine tumors, can produce excess amounts of 5-HIAA and serotonin, especially in individuals with carcinoid syndrome. Carcinoid syndrome is characterized by carcinoid tumors, flushing, heart disease,

and hepatomegaly.

Measurement of 5-HIAA in a 24-hour urine specimen can diagnose carcinoid disease with a high specificity.

Reference Values

99th percentile cutoff

Age	Female mg/24 h	Male mg/24 h
< or =23 months	< or =2.7	< or =2.3
24-35 months	< or =3.0	< or =2.6
3 years	< or =3.2	< or =2.9
4 years	< or =3.4	< or =3.2
5 years	< or =3.6	< or =3.6
6 years	< or =3.8	< or =3.9
7 years	< or =4.0	< or =4.2
8 years	< or =4.2	< or =4.5
9 years	< or =4.5	< or =4.8
10 years	< or =4.7	< or =5.1
11 years	< or =4.9	< or =5.3
12 years	< or =5.2	< or =5.6
13 years	< or =5.4	< or =5.8
14 years	< or =5.6	< or =6.1
15 years	< or =5.7	< or =6.3
16 years	< or =5.9	< or =6.4
17 years	< or =6.0	< or =6.6
18 years	< or =6.0	< or =6.7
19 years	< or =6.1	< or =6.8
20 years	< or =6.1	< or =6.9
21 years	< or =6.2	< or =6.9
22 years	< or =6.2	< or =7.0
23 years	< or =6.2	< or =7.0
24 years	< or =6.3	< or =7.1
25 years	< or =6.3	< or =7.2
26 years	< or =6.3	< or =7.2
27 years	< or =6.4	< or =7.3
28 years	< or =6.4	< or =7.4
29 years	< or =6.5	< or =7.5
30 years	< or =6.6	< or =7.5
31 years	< or =6.6	< or =7.6
32 years	< or =6.7	< or =7.7
33 years	< or =6.8	< or =7.7
34 years	< or =6.8	< or =7.8

35 years	< or =6.9	< or =7.9
36 years	< or =6.9	< or =7.9
37 years	< or =7.0	< or =8.0
38 years	< or =7.0	< or =8.1
39 years	< or =7.0	< or =8.2
40 years	< or =7.1	< or =8.2
41 years	< or =7.1	< or =8.3
42 years	< or =7.2	< or =8.4
43 years	< or =7.3	< or =8.5
44 years	< or =7.4	< or =8.6
45 years	< or =7.4	< or =8.7
46 years	< or =7.5	< or =8.8
47 years	< or =7.6	< or =8.9
48 years	< or =7.6	< or =9.0
49 years	< or =7.7	< or =9.1
50 years	< or =7.7	< or =9.2
51 years	< or =7.8	< or =9.3
52 years	< or =7.8	< or =9.4
53 years	< or =7.9	< or =9.5
54 years	< or =8.0	< or =9.6
55 years	< or =8.1	< or =9.7
56 years	< or =8.1	< or =9.7
57 years	< or =8.2	< or =9.8
58 years	< or =8.3	< or =9.8
59 years	< or =8.3	< or =9.8
60 years	< or =8.3	< or =9.9
61 years	< or =8.3	< or =9.9
62 years	< or =8.4	< or =9.9
63 years	< or =8.4	< or =10.0
64 years	< or =8.4	< or =10.0
65 years	< or =8.4	< or =10.0
66 years	< or =8.5	< or =10.1
67 years	< or =8.5	< or =10.1
68 years	< or =8.5	< or =10.1
69 years	< or =8.5	< or =10.2
70 years	< or =8.5	< or =10.2
71 years	< or =8.6	< or =10.2
72 years	< or =8.6	< or =10.2
73 years	< or =8.5	< or =10.1
74 years	< or =8.5	< or =10.1
75 years	< or =8.6	< or =10.1
76 years	< or =8.6	< or =10.0
77 years	< or =8.6	< or =10.0
78 years	< or =8.6	< or =10.0

79 years	< or =8.6	< or =10.0
80 years	< or =8.7	< or =9.9
81 years	< or =8.7	< or =9.9
82 years	< or =8.7	< or =9.9
83 years	< or =8.7	< or =9.9
84 years	< or =8.7	< or =9.9
85 years	< or =8.6	< or =9.8
86 years	< or =8.5	< or =9.8
87 years	< or =8.4	< or =9.7
88 years	< or =8.3	< or =9.7
89 years	< or =8.1	< or =9.5
90 years	< or =7.9	< or =9.4
91 years	< or =7.6	< or =9.2
92 years	< or =7.4	< or =9.0
93 years	< or =7.1	< or =8.8
94 years	< or =7.0	< or =8.7
= 95 years	< or =6.9	< or =8.6

For SI unit Reference Values, see www.mayocliniclabs.com/order-tests/si-unit-conversion.html

Interpretation

If pharmacological and dietary artifacts have been ruled out, an elevated excretion of 5-hydroxyindoleacetic acid is a probable indicator of the presence of a serotonin-producing tumor.

Cautions

Intake of food with a high content of serotonin (avocados, dates, eggplant, all fruit [including bananas, cantaloupe, grapefruit, kiwi fruit, melons, pineapple, plantains, plums], all nuts [including hickory nuts, butternuts, pecans, walnuts], and tomatoes and tomato products) within 48 hours of the urine collection could result in falsely elevated 5-hydroxyindoleacetic acid (5-HIAA) excretion.

Numerous drugs affect the excretion of 5-HIAA by different mechanisms, including increased serotonin synthesis, metabolism, and release and inhibition of uptake. The following medications can interfere with 5-HIAA results.
-Acetaminophen (Tylenol or generic versions)
-Tryptophan containing supplements

Patient should also avoid caffeinated beverages, such as tea and coffee, or caffeinated foods, such as dark chocolate, for 48 hours before and during specimen collection.

Clinical Reference

1. Grimaldi F, Fazio N, Attanasio R, et al. Italian Association of Clinical Endocrinologists (AME) position statement: a stepwise clinical approach to the diagnosis of gastroenteropancreatic neuroendocrine neoplasms. J Endocrinol Invest. 2014;37(9):875-909. doi:10.1007/s40618-014-0119-0
2. Vinik A, Hughes MS. Feliberti E, et al. Carcinoid tumors. In: Feingold KR, Anawalt B, Boyce A, et al, eds. Endotext [Internet]. MDText.com, Inc; 2000. Updated August 25, 2023. Accessed April 1, 2025. Available at www.ncbi.nlm.nih.gov/books/NBK279162/

3. Shah D, Mandot A, Cerejo C, Amarapurkar D, Pal A. The outcome of primary hepatic neuroendocrine tumors: A single-center experience. J Clin Exp Hepatol. 2019;9(6):710-715. doi:10.1016/j.jceh.2019.08.002
4. Perry D, Hayek SS. Carcinoid heart disease: A guide for clinicians. Cardiol Clin. 2019;37(4):497-503. doi:10.1016/j.ccl.2019.07.014
5. Degnan AJ, Tocchio S, Kurtom W, Tadros SS. Pediatric neuroendocrine carcinoid tumors: Management, pathology, and imaging findings in a pediatric referral center. Pediatr Blood Cancer. 2017;64(9). doi:10.1002/pbc.26477
6. Corcuff JB, Chardon L, El Hajji Ridah I, Brossaud J. Urinary sampling for 5HIAA and metanephrines determination: revisiting the recommendations. Endocr Connect. 2017;6(6):R87-R98. doi:10.1530/EC-17-0071

Performance

Method Description

5-Hydroxyindoleacetic acid (5-HIAA) is measured by solid phase extraction of an aliquot from a 24-hour urine collection and liquid chromatography tandem mass spectrometry analysis. 5-HIAA is quantitated using a custom synthesized stable isotope labeled internal standard (d6-5-HIAA) from calibration over a concentration range 0.5 to 150 mg/L.(Kroll CA, Magera MJ, Helgeson JK, Mattern D, Rinaldo P. A liquid chromatographic-tandem mass spectrometric method for the determination of 5-hydroxyindole-3-acetic acid in urine. Clin Chem. 2002;48[11]:2049-2051; Calanchini M, Tadman M, Krogh J, Fabbri A, Grossman A, Shine B. Measurement of urinary 5-HIAA: correlation between spot versus 24-h urine collection. Endocr Connect. 2019;8[8]:1082-1088)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

2 to 4 days

Specimen Retention Time

7 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Definition: HIAA

5-Hydroxyindoleacetic Acid, 24 Hour, Urine

Test Classification

This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

83497

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
HIAA	5-Hydroxyindoleacetic Acid, U	1695-6

Result ID	Test Result Name	Result LOINC® Value
9248	5-Hydroxyindoleacetic Acid, U	1695-6
TM35	Collection Duration	13362-9
VL33	Urine Volume	3167-4