

## 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](http://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. 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/](http://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 metanephhrines 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 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