



## Lab Tests Online®

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## 5-HIAA

**Also known as:** 5-hydroxyindoleacetic acid, HIAA, Serotonin metabolite

**Formally known as:** 5-hydroxyindoleacetic acid

**Related tests:** Serotonin, Chromogranin

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### At A Glance

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#### Why get tested?

To help diagnose and monitor treatment for a serotonin-secreting carcinoid tumor

#### When to get tested?

When you have symptoms suggestive of a carcinoid tumor such as flushing, diarrhea, and/or wheezing, and at intervals following treatment

#### Sample required?

A **24-hour urine sample**; rarely a **random urine sample**

### The Test Sample

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#### What is being tested?

This test measures the amount of 5-hydroxyindoleacetic acid (5-HIAA) in the urine. 5-HIAA is a muscle stimulant and the primary metabolite of serotonin, a hormone derived from the amino acid tryptophan. Serotonin is produced as needed by the nervous system, mainly the brain, but also special cells in the bronchial tubes (lungs) and gastrointestinal tract. It helps transmit nerve impulses and constrict blood vessels, participates in the wake-sleep cycle, and affects mood. After it is used by the body, serotonin is broken down in the liver, and its metabolites, including 5-HIAA, are excreted in the urine.

Ordinarily, only small varying amounts of 5-HIAA are present in the urine. Large quantities of serotonin and 5-HIAA may be produced, however, by some carcinoid tumors. Carcinoid tumors are slow-growing masses that can form in the gastrointestinal tract, on the appendix, and in the lungs. According to the American Cancer Society, there are about 5,000 carcinoid tumors diagnosed each year in United States. Many more of these tumors may exist, but most remain small and do not cause any symptoms. When carcinoid tumors are discovered in asymptomatic patients during surgical procedures performed for other reasons, they are called "incidental" tumors. A small percentage of these tumors may eventually grow large enough to cause obstructions in the intestines or bronchial tubes of the lungs.

About 10% of carcinoid tumors, primarily those found in the gastrointestinal tract, will produce enough serotonin to cause symptoms such as flushing of the face, diarrhea, a rapid heart rate, and wheezing, usually only after the tumor has spread to the liver. These symptoms are referred to as carcinoid syndrome. The serotonin that causes carcinoid syndrome may be released continuously or intermittently and can lead to significantly increased quantities of 5-HIAA in the urine.

### **How is the sample collected for testing?**

For the **24-hour urine collection**, all of the urine should be saved for a 24-hour period. It is better to keep sample in cool, dark place, such as a refrigerator. Pre-sample preparation is important for accurate 5-HIAA test results. For more information, see **Is there anything else I should know** and talk to your doctor.

## **The Test**

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### **How is it used?**

5-HIAA may be ordered by itself or along with a blood serotonin level to help diagnose and monitor carcinoid tumors. A **24-hour urine sample** is preferred for the 5-HIAA test because the metabolite level in the urine can vary during the day. A **random urine sample** is sometimes tested, usually along with a **urine creatinine level**, when a 24-hour sample is not feasible. The random sample is not as accurate, however, and if the excess 5-HIAA is released intermittently, then it may be missed.

### **When is it ordered?**

This test is primarily ordered when a patient has symptoms suggestive of a carcinoid tumor. It may also be ordered at intervals to help monitor the effectiveness of treatment in patients who have been diagnosed with and treated for a serotonin-secreting carcinoid tumor.

### **What does the test result mean?**

A significantly increased level of 5-HIAA in a **24-hour urine sample** in a patient with carcinoid syndrome symptoms is suggestive but not diagnostic of a carcinoid tumor. In order to diagnose the condition, the tumor itself must be located and a sample of it examined. The doctor will frequently follow an abnormal test result with an order for an imaging scan to help locate any tumor(s) that may be present.

A patient with symptoms may still have a carcinoid tumor even if the concentration of 5-HIAA is normal. The patient may have a tumor that does not secrete serotonin or one that secretes it intermittently. A patient with no symptoms and normal levels of 5-HIAA is unlikely to have a serotonin-secreting carcinoid tumor.

In patients who are being monitored following treatment for carcinoid tumor, decreasing levels of 5-HIAA indicate a response to treatment, while increasing or continued excessive concentrations indicate that the treatment has not been successful.

### **Is there anything else I should know?**

Foods such as avocados, bananas, pineapples, plums, walnuts, tomatoes, kiwi fruit, and eggplant can interfere with 5-HIAA measurement and should be avoided for three days prior to and during urine collection.

There are also a variety of drugs that can affect the 5-HIAA test. Medications that can

increase 5-HIAA include acetaminophen, caffeine, ephedrine, diazepam (Valium), nicotine, glyceryl guaiacolate (an ingredient found in some cough medicines), and phenobarbital. Medications that can decrease 5-HIAA include aspirin, ethyl alcohol, imipramine, levodopa, MAO inhibitors, heparin, isoniazid, methyldopa, and tricyclic antidepressants. Patients should talk to their doctor before decreasing or discontinuing any medications.

## Common Questions

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### 1. Are there other metabolites of serotonin?

Yes, the other major metabolite is 5-hydroxytryptophol (5-HTOL). This substance is not routinely tested for but may sometimes be performed in a ratio with the 5-HIAA test to evaluate ethyl alcohol ingestion. An increased ratio of 5-HTOL/5-HIAA can be indicative of alcohol consumption in both living people and postmortem.

### 2. Can I do the 5-HIAA urine test at home?

No, this test requires specialized equipment and must be performed in a laboratory. Not every laboratory will perform this assay; in some cases, your sample will need to be sent to a [reference laboratory](#).

### 3. Will my results be accurate if I must continue to take my medication?

If the drug is one that can increase or decrease the amount of serotonin and 5-HIAA, then your results may be affected. However, it is up to your doctor and you to decide whether or not your medication can be safely stopped prior to and during the test collection. If your drugs must be taken, then your doctor will interpret the test results with this in mind.

### 4. Are some people at a higher risk for developing a carcinoid tumor?

Anyone at any age can develop a carcinoid tumor but, according to the American Cancer Society, the average age at diagnosis is usually about 55 to 65. Patients with a family history of multiple endocrine neoplasia (MEN1), a genetic condition that increases a patient's risk of developing tumors in the endocrine system glands, may be at higher risk for developing a carcinoid tumor.

## Ask A Question

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If you still have a question about your test or need help interpreting the results of your test, you can visit the ASCLS web site to complete a lab testing information request form, and a certified clinical laboratory scientist will gladly help you! Your communication will be kept confidential. Go there now: <http://www.ascls.org/labtesting/disclaimer.asp>.

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[American Cancer Society: Gastrointestinal Carcinoid Tumors, A Detailed Guide](#)

This article was last reviewed on June 12, 2006.