

## BIOTIN (VITAMIN B7) MAY INTERFERE WITH LABORATORY TESTS

Patients may take biotin at the direction of a healthcare provider or consume it via over-the-counter multivitamins and supplements meant to improve hair, skin, and nails. Blood samples from these patients can cause some immunoassay test results to be incorrect which may lead to misdiagnosis and inappropriate patient care. If a lab test result does not match the clinical presentation of the patient, consider biotin interference as a possible source of error.

## BIOTIN (VITAMIN B7) INTAKE

Recommended daily intake: 30 micrograms/day

Some supplements may exceed recommended daily intake by up to 650 times.

## TO ENSURE ACCURATE TEST RESULTS

Ask patients if they are taking multivitamins or supplements containing biotin. Patients taking biotin should refrain from doing so for three days prior to sample collection to allow for adequate clearance of biotin.<sup>1</sup>

Additional details from the U.S. Food & Drug Administration follow.

Please direct questions to:

Dr. David Grenache

Chief Scientific Officer

TriCore Reference Laboratories

505-938-8647 | 1-800-245-3296 ext. 8647

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### Reference

<sup>1</sup> Grimsey, P., Frey, N., Bendig, G., Zitzler, J., Lorenz, O., Dusanka, K., & Zaugg, C. E. (2017). Population pharmacokinetics of exogenous biotin and the relationship between biotin serum levels and in vitro immunoassay interference. *International Journal of Pharmacokinetics*, 2(4), 247–256. <http://doi.org/10.4155/ipk-2017-0013>.

## U.S. FOOD & DRUG ADMINISTRATION NOTICE

<https://www.fda.gov/Safety/MedWatch/SafetyInformation/SafetyAlertsforHumanMedicalProducts/ucm586641.htm>

### Biotin (Vitamin B7): Safety Communication - May Interfere with Lab Tests

[Posted 11/28/2017]

**AUDIENCE:** Laboratory, Health Professional, Patient

**ISSUE:** The FDA is alerting the public, health care providers, lab personnel, and lab test developers that biotin can significantly interfere with certain lab tests and cause incorrect test results which may go undetected.

Biotin in blood or other samples taken from patients who are ingesting high levels of biotin in dietary supplements can cause clinically significant incorrect lab test results. The FDA has seen an increase in the number of reported adverse events, including one death, related to biotin interference with lab tests.

Biotin in patient samples can cause falsely high or falsely low results, depending on the test. Incorrect test results may lead to inappropriate patient management or misdiagnosis. For example, a falsely low result for troponin, a clinically important biomarker to aid in the diagnosis of heart attacks, may lead to a missed diagnosis and potentially serious clinical implications. The FDA has received a report that one patient taking high levels of biotin died following falsely low troponin test results when a troponin test known to have biotin interference was used.

The FDA is aware of people taking high levels of biotin that would interfere with lab tests. Many dietary supplements promoted for hair, skin, and nail benefits contain biotin levels up to 650 times the recommended daily intake of biotin. Physicians may also be recommending high levels of biotin for patients with certain conditions such as multiple sclerosis (MS). Biotin levels higher than the recommended daily allowance may cause interference with lab tests.

Patients and physicians may be unaware of biotin interference in laboratory assays. Even physicians who are aware of this interference are likely unaware as to whether, and how much biotin, patients are taking. Since patients are unaware of biotin interference, patients may not report taking biotin supplements to their physicians, and may even be unaware they are taking biotin (e.g., when taking products generally labeled for their benefits to hair and nails).

The FDA is working with stakeholders to better understand biotin interference with laboratory tests, and to develop additional future recommendations for safe testing in patients who have taken high levels of biotin when using laboratory tests that use biotin technology.

The FDA is monitoring reports of adverse events associated with biotin interference with laboratory tests and will update the public if significant new information becomes available.

**BACKGROUND:** Many lab tests use biotin technology due to its ability to bond with specific proteins which can be measured to detect certain health conditions. For example, biotin is used in hormone tests and tests for markers of cardiac health like troponin. Biotin, also known as vitamin B7, is a water-soluble vitamin often found in multi-vitamins, prenatal vitamins, and dietary supplements marketed for hair, skin, and nail growth.

### RECOMMENDATIONS:

*For Health Care Providers:*

- Talk to your patients about any biotin supplements they may be taking, including supplements marketed for hair, skin, and nail growth.
- Be aware that many lab tests, including but not limited to cardiovascular diagnostic tests and hormone tests, that use biotin technology are potentially affected, and incorrect test results may be generated if there is biotin in the patient's specimen.
- Communicate to the lab conducting the testing if your patient is taking biotin.

- If a lab test result doesn't match the clinical presentation of your patient, consider biotin interference as a possible source of error.
- Know that biotin is found in multivitamins, including prenatal multivitamins, biotin supplements, and dietary supplements for hair, skin, and nail growth in levels that may interfere with lab tests.
- Report to the lab test manufacturer and the FDA if you become aware of a patient experiencing an adverse event following potentially incorrect laboratory test results due to biotin interference.

*For Lab Personnel:*

- If you use assays with biotin technology, be aware that it is difficult to identify samples that contain biotin; therefore, it is important to communicate with health care providers and patients to prevent incorrect test results.
- If you are collecting samples in the lab, ask whether the patient is taking biotin.
- Educate health care providers about biotin interference with certain lab tests used in your lab.
- Consider that the daily recommended allowance for biotin is 0.03 mg and these biotin levels do not typically cause significant interference. However, supplements containing high biotin levels including those marketed for hair, skin, and nail benefits, may contain up to 20 mg of biotin, and physicians may recommend up to 300 mg per day for conditions such as multiple sclerosis. Biotin levels higher than the recommended daily allowance may cause significant interference with affected lab tests.
- Be aware that specimens collected from patients taking high levels of biotin may contain more than 100 ng/mL biotin. Concentrations of biotin up to 1200 ng/mL may be present in specimens collected from patients taking up to 300 mg per day.
- Currently available data is insufficient to support recommendations for safe testing using affected tests in patients taking high levels of biotin, including about the length of time for biotin clearance from the blood.
- Communicate with the lab test manufacturer if you have questions about biotin interference.

*For Consumers:*

- Talk to your doctor if you are currently taking biotin or are considering adding biotin, or a supplement containing biotin, to your diet.
- Know that biotin is found in multivitamins, including prenatal multivitamins, biotin supplements, and supplements for hair, skin, and nail growth in levels that may interfere with laboratory tests.
- Be aware that some supplements, particularly those labeled for hair, skin, and nail benefits, may have high levels of biotin, which may not be clear from the name of the supplement.
- If you have had a lab test done and are concerned about the results, talk to your health care provider about the possibility of biotin interference.

Healthcare professionals and patients are encouraged to report adverse events or side effects related to the use of these products to the FDA's MedWatch Safety Information and Adverse Event Reporting Program:

- Complete and submit the report Online: [www.fda.gov/MedWatch/report](http://www.fda.gov/MedWatch/report)
- [Download form](#) or call 1-800-332-1088 to request a reporting form, then complete and return to the address on the pre-addressed form, or submit by fax to 1-800-FDA-0178