December 27, 2017

On November 28, 2017, the FDA issued the following alert:

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

"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."

To assist in the interpretation of the 'Biotin" alert, the following information pertains to providers that use HCMC Clinical Laboratories services.

Many lab tests use biotin technology in their assays to measure hormones and proteins by immunoassay methodologies. 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. Differences in assay methods can cause biotin supplementation to either falsely increase or decrease results.

- **The major immunoassay analyzer used at HCMC, the Roche Cobas system, does have several assays that are significantly affected by biotin supplementation.**
    - **TSH**, **thyroglobulin antibody,** and **cTnT** (which is not measured at HCMC) values are substantially decreased. Based on the representative table shown below, biotin supplementation at 5 to 10 mg (even a single dose) can cause incorrect, lower results in a patient's specimen. The higher the biotin supplemental dose, the more profound the effect will be.
    - **LH** and **FSH** are affected, with lower results, but to a lesser degree.
    - **ACTH, 25-hydroxy Vitamin D, free T4, and free and total T3** appear to be affected, with a positive (increased) interference.
    - Unpublished data has been communicated that about **1.5% of the normal population may have biotin concentrations in their blood that would affect the 6 assays noted above**. While biotin appears to peak in blood at about 1.5h after ingestion, estimates of clearance vary considerably; half live range 7 to 19h. Excretion is predominately renal. It is known that biotin metabolites which are cleared by the kidneys, also are likely to cause assay interferences.

Our Ask:

- 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 (typically 5 to 10 mg); with larger doses (100-300 mg) given to patients treated for multiple sclerosis.
- Talk to your patients about any biotin supplements they may be taking, particularly supplements marketed for hair, skin, and nail growth.
- If you suspect biotin interference, please notify the laboratory, and we will have the specimen analyzed on an instrument/assay that does not have the interference issue our Roche assays do.
- **All other testing analyzers/instruments (non-Roche) used at HCMC clinical laboratories do not use biotin technology in their assays and are not affected**.

- Biotin may interfere with tests performed at our send out laboratories, and we are in the process of communicating with our primary send-out lab, ARUP and Mayo, to determine whether specific tests may be affected. This will be communicated to you early January 2018.
- The laboratory is working on a process to remove biotin as a source of interference in specimens.
- Please contact the laboratory with any questions or concerns regarding the 'biotin' issue. Both Dr. Apple and Dr. Love can be reached by calling their office phones or pagers.

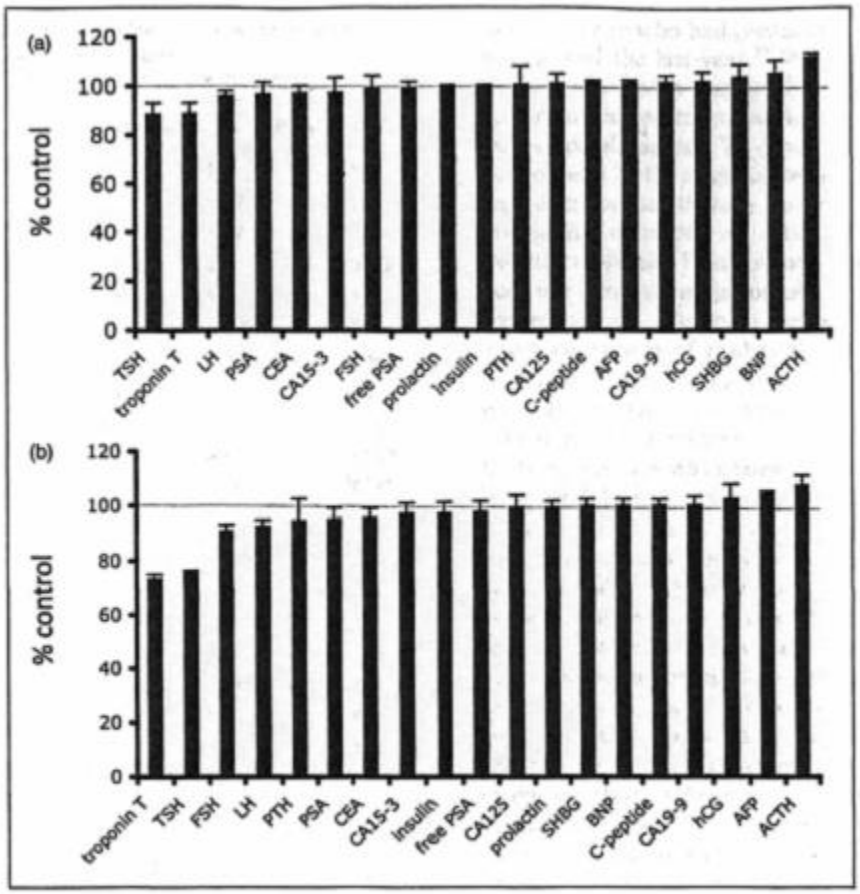

Figure 3. Simulation of 5–10 mg biotin supplementation: effect on sandwich immunoassays. The effect of biotin at 15.6 ng/mL (a) and 31.3 ng/mL (b), expressed as % of control, unspiked serum samples. The results indicate average plus standard deviation of three separate experiments. For the majority of analytes, these biotin concentrations had minor effects on measured analyte; however, some assays, notably TSH and troponin T, demonstrated interference at these concentrations.

References: Trambas et al. Annl Clin Biochem 2017 - doi: 10.1177/0004563217707783; Li et al. JAMA 2017;318:1150-1160.