

ASK A SPECIALIST**Ask a Pathologist: Why Can't You Just Release the Value and I'll Figure it Out?**Jared Coberly¹¹Department of Pathology and Anatomical Sciences, University of Missouri, Columbia, MO

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Am J Hosp Med 2019 July;3(3):2019.011 <https://doi.org/10.24150/ajhm/2019.011>**Question**

I ordered a comprehensive metabolic panel. The lab will not release the potassium value because of an interference. I need that result! Why can't they just release the value and let me decide what to do with it? I'll skip the lab and just run it on a point-of-care device.

ANSWER

An order for a laboratory service, such as a comprehensive metabolic panel (CMP), creates a duty between the pathologist and the patient, even though a traditional patient-physician relationship is not established. Still, pathologists have a moral and legal obligation to the patient to provide precise and accurate results, and in the laboratory setting that means verifying the reported values are clinically valid. In cases where the validity of the result is in question, it is often prudent to hold the result and investigate. Let's look at a few common reasons that a result will not be automatically released by a laboratory.

Hemolysis: Hemolysis may interfere with laboratory results in a number of ways. The free hemoglobin itself may absorb light at a frequency that the instrument misinterprets as increased concentration of the analyte being tested. The spilled erythrocytic intracellular contents, such as potassium and lactate dehydrogenase, will be detected by the analyzer but do not represent

the concentrations in the patients circulating blood. Approximately 90% of hemolyzed samples represent in-vitro hemolysis and have no relationship to the patient's clinical condition, with the overwhelming majority of causes being related to sample collection^{1,2}. Modern chemistry analyzers detect hemolysis and will flag a result if hemolysis exceeds pre-defined thresholds. If the laboratory suspects that the result is not correct because of an interfering substance, we do not automatically release the result. Knowingly communicating an incorrect result, and knowing that the treating physician will likely act based on that result, runs afoul of the duty the pathologist has to the patient to render accurate and clinically valid information. In the case of hemolysis, the laboratory will often reach out to the team and try to understand the risk of true hemolytic process versus in-vitro hemolysis. Since most hemolysis is draw-related, a new sample is generally all that is required to produce a valid result.

Lipemia and icterus: Sometimes the interfering substance is found in-vivo, such

as in lipemia or icterus, but still precludes a clinically valid result. If the sample is too thick from lipemia for sufficient light to pass through the sample, the resulted value will have no meaning. Or if a test is based on a colorimetric method, yellow-tinged icteric samples may cause inaccurate values to be recorded.

Delta checks: “Delta check” is lab language for measuring the difference between the current result and a previous result (Delta being the Greek letter used to represent change). The principle is as follows: If the current result is physiologically improbable compared to the previous result, something’s wrong. The lab staff should investigate causes of the error. Many times, the cause is unclear and a new sample may be necessary to verify the authenticity of the result. For example, if a sodium result was 125 mEq/L at noon and the instrument is detecting 145 mEq/L at 2:00 p.m. for that same patient, the laboratory staff should hold the current result and try to resolve the error including a review of the machine’s operation and quality control results. Often times, delta checks flag because the wrong patient label was affixed to a blood sample. In fact, Delta checks provide the last line of defense in these mislabeled, “wrong blood in tube,” errors. Of course, critically ill patients, especially those being tested during resuscitation, may have

large swings in values that would be physiologically improbable otherwise. Since the patient’s immediate status is not always apparent to the laboratory staff, communication between the laboratory and the bedside may be necessary to resolve the discrepancy.

As testing moves closer and closer to the bedside and out of the laboratory, hospitalists and intensivists should become knowledgeable about the interferences and limitations of point-of-care devices, which are not identical to their larger automated core laboratory instruments. Just because the machine gives a number, doesn’t mean that value has clinical meaning. Understanding of the potential for error is critical component of clinical diagnosis by laboratory methods. No answer may be better than a bad answer.

Notes

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