

Blood Collector's ATM

Abbreviated Teaching Modules
for staff development, competency, and classroom



The Order of Draw #3201

Much controversy surrounds the Order of Draw. Even some very experienced phlebotomists will insist there is no Order of Draw. So what is the truth? The truth is the Order of Draw is very real and is in one of the standards published by CLSI, the Clinical and Laboratory Standards Institute. According to CLSI, the correct Order of Draw is as follows: Sterile tubes or vials are drawn first. These would be for blood cultures if any are ordered. Second in the lineup are sodium citrate tubes, the light blue ones. Next in the order are serum tubes (with or without a clot activator), which have either a red, black and red speckled or gold top. Following serum tubes is the heparin tube, which generally has a green top. Fifth in the Order of Draw is the EDTA (ethylenediaminetetraacetic acid) or lavender-top tube. Bringing up the rear is the oxalate or gray-top tube.

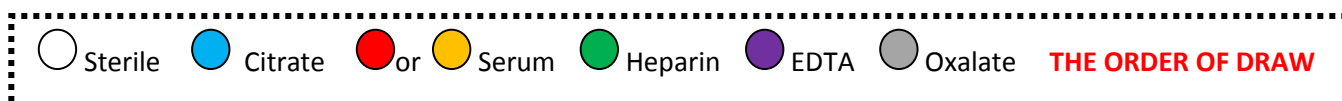


The proper Order of Draw is demonstrated in the photo to the left. Every draw does not necessarily include all tubes, but regardless, this is the order in which whatever tubes are required should be filled. It is important to understand the CLSI standard and facility policies regarding the Order of Draw. Some facilities may use a gold-top serum tube instead of a red-top serum tube. The important thing to remember is not the color of the top, but the additive in the tube.

So why is there an order of draw? An order of draw was established for the sole purpose of negating any effect of additive carryover. Some additives are liquid and some are dry. The additive is sprayed inside the tube during manufacturing. The dry additive clings to the walls of the tube. When collecting a blood specimen using a tube holder, the interior needle of the device punctures the rubber stopper of the tubes. As this occurs, it is possible for the inner needle to come in contact with the blood-additive mixture as the tube fills and a minute amount carry over into the next tube when tubes are exchanged. Even though dry additives are sprayed onto the inside walls of the tube during the manufacturing process, some can adhere to the bottom of the rubber stopper. This is why holding the tube upright while filling the tube with a winged collection set does not prevent additive carryover from occurring during tube exchange.

What happens if an additive carries over from one tube to another? That depends on the additive. Serious consequences can occur when an EDTA tube is drawn ahead of one that will be tested for potassium, such as a serum or heparin tube. EDTA is rich in potassium. If any EDTA carries over into a tube which will be tested for potassium, the results reported will be inaccurate. If a patient is medically managed according to inaccurate test results, the outcome could be catastrophic. For instance, if a patient will be going to surgery, the physician will want to make sure the patient has a normal electrolyte profile. If the proper Order of Draw is not followed and an EDTA tube is filled before a serum tube, the results reported to the physician may show the patient's potassium to be falsely elevated. What if the patient's potassium is actually low but is reported as normal due to the additive introduced into the blood sample from the EDTA in the prior tube? For the patient going to surgery and his/her family, that is bad news. Patients who go to surgery with low potassium levels can experience seizures or cardiac arrest. The physician and surgeon who thought they could depend on the results from the lab are left wondering what happened. Different additives can have other effects on subsequent tubes. Clot activators from serum tubes, for example, may affect citrate tubes destined for coagulation studies.

Written standards were established to define how blood samples should be collected. Proper procedure must be followed in order to obtain quality samples that accurately reflect the physiology of the patient. Following the established Order of Draw is good patient care and just one part of the sample collection process. If any part of the collection process is done incorrectly, patient test results could be negatively impacted. The lab can't tell if you drew the samples in the wrong order, but *you* know. You make a difference for every patient you encounter. Make sure the difference you make is a positive one by following the proper Order of Draw every time you obtain a blood sample for testing.



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THE ORDER OF DRAW #3201

In the article about the Order of Draw, you learned there is a correct order in which tubes must be filled. You learned that the order in which tubes are filled can have a critical impact on the test results reported to the physician, and thus the care the patient receives. You also discovered that with each and every blood specimen you collect you have the opportunity to be an important advocate for the patient and can influence how he/she is diagnosed, medicated, and managed.

Test Your Knowledge:

1. Why is there an Order of Draw?
 - a) to establish the number of tubes required for a particular test
 - b) to negate the effects of additive carryover on test results
 - c) to reduce collection costs by managing the number of tubes used for each patient
 - d) to prevent hemoconcentration
2. What is one analyte that can be affected if an EDTA tube is drawn ahead of a tube to be analyzed for electrolytes?
 - a) serum
 - b) potassium
 - c) protime
 - d) plasma
3. What is the correct Order of Draw?
 - a) sterile, serum, citrate, heparin, EDTA, oxalate
 - b) sterile, EDTA, serum, citrate, heparin, oxalate
 - c) sterile, citrate, serum, heparin, EDTA, oxalate
 - d) sterile, heparin, citrate, serum, EDTA, oxalate
4. What is the organization that sets standards for blood specimen collection?
 - a) CLSI (Clinical and Laboratory Standards Institute)
 - b) ASCP (American Society for Clinical Pathology)
 - c) CLIA (Clinical Laboratory Improvement Act)
 - d) NAACLS (National Accrediting Agency for Clinical Laboratory Sciences)
5. Who is responsible for obtaining blood samples according to the proper Order of Draw?
 - a) the ordering physician
 - b) the medical laboratory technologists performing the tests
 - c) the phlebotomist
 - d) the department ordering the tests

Name: _____

Date: _____

Facility/Supervisor _____

Dept: _____