Reasons for Hemolysis
Whole Blood Specimens

Why is hemolysis in clinical trials specimens important?
Hemolysis can be an important unwanted effect in clinical trial tests and can cause inaccurate results. Hemolysis is the result of the breaking open of red blood cells and the release of hemoglobin into the surrounding fluid.

Causes of Hemolysis in Whole Blood Specimens
A difficult phlebotomy draw: Hemolysis of RBC may be caused by multiple needle-sticks, movement of needle while in tissue or drawing blood through a bruised area.

Specimen freezes at site or during transport
- Specimen is frozen in error prior to packaging
- Placing Covance transport box outside office/clinic for later or after-hours courier pickup in winter
- Using an outdoor pickup box in winter
- Not using Gel-pack or other thermal insulator supplied by Covance to protect specimen from extremely cold temperatures.

Improper use of Covance packaging causes the specimen to freeze
- In refrigerated/ambient or frozen/ambient combination shipping package the barrier between the ambient specimens and refrigerant packs or dry ice was improperly placed or eliminated
- In refrigerated packaging, the specimen was placed in contact with the refrigerant pack with no barrier in between
- In the frozen/ambient combination packaging, the barrier between the ambient and the frozen compartments was improperly placed or eliminated.

Specimen is subjected to high temperatures at site
- Site places specimen next to a heater or a radiator for a long period prior to packaging for transport. This can happen in the investigator’s clinic or office or if the package is placed in the hallway prior to courier pickup.

Specimen is subjected to high temperatures during transport
- Site did not use Gel-pack, Isobag or other thermal insulator supplied by Covance to protect specimen from extremely hot temperatures
- Couriers in hot climates or during summer months keeps specimen in hot vehicle prior to drop-off at airport.

Excessive suction during syringe collection.

Violent mixing of the specimen
This is not needed on most whole blood specimens.

Excessive, vigorous transfer of the specimen from syringe to the collection tube

Clotting of specimen prior to transport.
This will cause cancellation of testing, but may also cause hemolysis.
Most causes of *In vitro* hemolysis are related to specimen collection that involve difficult collections, unsecure line connections, contamination, incorrect needle size, improper tube mixing and incorrectly filling tubes.

Excessive suction can cause the red blood cells to literally smash on their way through the hypodermic needle by turbulence and physical force. Hemolysis is more likely to occur when a patient's veins are difficult to find or when they collapse as blood is removed by a syringe or a modern vacuum tube.

Experience and proper technique are essential for any phlebotomist or nurse to prevent hemolysis. *In vitro* hemolysis can also occur in blood samples stored in prolonged storage or stored in incorrect conditions (i.e., too hot and/or too cold).

*If you have further questions about the information in this document, don’t hesitate to contact us at (800) 327-7270.*