Avoiding specimen transportation errors

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The increasing trend toward ambulatory care, home healthcare, nursing home care, and other alternate sites, has created variations in laboratory services and increased probability of medical errors. As an example, in order to increase laboratory volume, laboratory administrators have had to redirect blood collection services to outlying home and clinic settings via contracts with various physicians’ clinics and home healthcare agencies. In addition, many hospital phlebotomists have had their positions changed into courier blood collectors who must travel several miles a day, in sometimes inclement weather conditions, to collect blood specimens from home and ambulatory clinic settings. These specimens then must be transported to the core laboratory for testing.

All of these variations in specimen collection and transportation add to the likelihood of increased errors in laboratory testing. Of laboratory errors, 46 percent to 68 percent occur in the preanalytical phase rather than the analytical and postanalytical phases (10 percent to 20 percent).1,2 However, many laboratory and healthcare personnel overlook the impact that the preanalytical specimen collection phase has in medical errors, especially in the transport of specimens. These specimens then must be transported to the core laboratory for testing.

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With the variations in these ambulatory and home specimen collections and transportation, a high probability exists for overlooking safety policies for specimen handling and transportation in off-site blood collections. Important questions are: What are the liability issues regarding the use of phlebotomists as specimen couriers? How should risk management be handled for specimen collection and handling?

Safety considerations in blood specimen transportation

Proper handling throughout specimen collection and transportation is essential for maintaining specimen integrity as well as protecting the blood collector and others from accidental exposure to potentially infectious microorganisms. If a collected specimen is transported under improper temperature (i.e., too cold or too hot), and/or other improper conditions (i.e., not maintained in vertical position to promote clot formation and avoid hemolysis), the laboratory testing results can be altered, leading to misdiagnosis and inappropriate treatment of the patient. It is imperative to establish and follow step-by-step procedures in the handling and transport of specimens. For the safety of the blood collector and patient in off-site collections, it is imperative to have knowledge of infection control protocols for ambulatory and home healthcare because these environments are uncontrolled and unpredictable sites in which to provide care.3

All specimens must be handled according to the Standards/Universal Precautions guidelines written by the Centers for Disease Control and Prevention (CDC) and enforced by the Occupational Safety and Health Administration (OSHA).4 Whether the blood collection occurs at a patient’s home or at an ambulatory clinic, it is essential to use safety blood collection equipment that effectively reduces the risk of an exposure incident.5 The federal Needlestick Safety and Prevention Act that became law on April 18, 2001, requires the use of effective safer medical devices.6 It also requires a new type of sharps injury log that includes detailed information on the injury, including the work area where the exposure incident occurred and an explanation of how the incident occurred (i.e., includes home health and other off-site blood collections).

In addition to using safer blood collection equipment, the blood collector who ventures out to off-site locations to collect blood from patients should:

- Carry all blood collection equipment and specimens in a lockable container to avoid an accidental spill if the vehicle is in a collision;
- Have a spill kit available in the courier vehicle;
- Have Department of Transportation training on requirements for packaging and transporting potentially infectious specimens;
- Transport each patient’s specimen in a sealed or zip-locked plastic bag with an outside pocket for the laboratory requisition.
Ensure that the specimen container used to transport specimens is clearly marked as biohazardous on the outside of the container; and have cold packs in the container for specimen transport during hot weather and a heated vehicle for transport of specimens during cold weather.

These issues are important to review with the blood collectors who are performing off-site collections in order that they maintain a perspective of the ways that transportation alterations can adversely affect patients’ laboratory test results.

Preanalytical considerations

Blood specimens should be transported carefully to avoid causing the blood to hemolyze. Plastic blood collection tubes and plastic microcollection containers should be maintained in a vertical position to promote complete clot formation, if required, and reduce the possibility of hemolysis. Plastic capillary tubes should be used for blood collection and may be carried horizontally if sealed completely at the ends. When collecting blood for bilirubin determinations, amber microcollection tubes, wrapping aluminum foil around the tubes and/or carrying the tubes in a container that closes completely should be used to avoid light exposure to the specimen. Blood specimens for potassium and cortisol analysis need to be tested within two hours from the time of collection. If the specimens cannot be delivered within this time period, collect the blood in serum or plasma separator tubes to avoid erroneous test results. An ice water slurry should be used to transport blood specimens collected for lactic acid, renin, insulin, and ammonia analysis in order to slow down the metabolic processes that are continuing in the blood. Blood culture specimens collected in SPS tubes should be transported to the laboratory as quickly as possible so that the blood can be transferred to culture media.

Risk management and professional liability

The function of a risk management program is to identify the risk of loss, to determine the most efficacious method to manage the identified risks, and then to evaluate by outcome measures attached to those risks. Implementing quality management and safety programs, and developing an incidence/occurrence reporting system, can reduce risks in blood collection at off-site locations and educate the involved personnel to assure safe and competent job performance. As examples of reducing risks in blood collection at home and ambulatory care clinics, the blood collector should:

- Always have a schedule posted at the laboratory for the time and location of blood collections and when he/she will return to the laboratory;
- Always wear the healthcare institution’s ID badge;
- Always carry the vehicle keys in hand or place them in a pocket and have a spare set hidden on the vehicle;
- Carry little cash and just one credit card.

If the laboratory uses contract personnel for blood collections and courier services, it is important for the laboratory and contracted blood collectors to have professional liability insurance coverage for blood collection services. Also, the laboratory administration should review local, state, and federal contract and liability issues to determine the liability risk to the laboratory as well as the contract blood collector/courier service provider.

These overall issues and policies in blood specimen collection and transportation should be outlined in a manual specifically written for blood collectors involved in off-site collections with courier services of specimens back to the laboratory.

References