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Sticking points—how to handle difficult blood draws



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Veins collapse. Patients panic. Samples hemolyze. Children kick. Difficult venipunctures are simply part of the everyday drill for most phlebotomists, who have to be prepared for many different eventualities. "Anybody who expects just routine draws is quickly disappointed," says Dennis Ernst, director of the Center for Phlebotomy Education in Corydon, Ind. "Because you have five or six categories of patients who present challenges—and you never know who's going to walk in the door."

In an interview with CAP TODAY, Ernst explains steps phlebotomists can take to avoid being blindsided when drawing blood from drug addicts, obese people, critical care patients, the elderly, children and neonates, needle-phobic patients, and others. It's not just about getting the blood in the tube, he says. "It's also about making sure the process doesn't compromise the sample and affect test results."

Patients in critical care units are the most common class of potential difficult draws because they are subject to more frequent laboratory testing; they may have injuries, incisions, or edema that restrict their drawing sites, and the multiple infusion lines attached to them are often in the way. These lines can be used as an access point into their circulatory system. But such line draws have a downside, Ernst warns.

"The problem is when you draw blood from a line, you save the patient from the discomfort of a stick, or even yourself from the challenge of a difficult draw. But the line draw comes with variables that can change the test result." For example, if the line isn't flushed before the sample is withdrawn, the sample can be diluted with saline or contaminated with IV fluids. Samples drawn from lines are often hemolyzed, which can alter test results or lead to specimen rejection and a venipuncture.

Most nursing services in the ICU are going to draw from the line whenever they can because it's quicker and easier than venipuncture, especially if the patient has difficult veins, Ernst says. Facilities that actually have a policy against line draws are rare. But because it's a challenge to get accurate results from a line draw, "it's a conundrum for the lab: Line draws are convenient, yet problematic."

Whether the phlebotomist is using a syringe with a needle going into a vein, or a syringe attached to a central line, minimizing pressure during the draw will help avoid problems. "You want to pull slowly, because if you pull quickly you will hemolyze red cells and that will alter test results or lead to a rejected specimen. Those red cells can sustain a little pressure, but when they're pulled too hard through the beveled opening of the needle, or the narrow opening of a cannula in the case of a line draw, a lot of sheer forces are exerting right at that tip."

While hemolysis generally occurs in about three percent of all samples drawn at the average facility, studies have shown that as much as 24 percent of line draws can hemolyze. "Line draws are just notorious for hemolyzing samples, and you are never going to get rid of that potential. But you can minimize it."

A draw that is difficult before it is even begun is one in which the patient is unable to speak and does not have a bracelet. "What should happen is the phlebotomist should go to the nurse, say I can't draw this patient until they have a bracelet, and when the bracelet is on, ask the caregiver to state the patient's name. Nurses may feel put out about that, but the phlebotomist is really the last line of defense when it comes to laboratory-induced medical mistakes. Everybody has seen patients who have somebody else's arm bracelet on; it happens a lot." Studies have also shown that between seven percent and 16 percent of ID bands contain erroneous information.

The elderly patient can prove especially challenging for the phlebotomist. Dehydration, loss of vein patency, and low blood pressure are typical issues, while arthritis, injury, or stroke may give elderly patients a limited range of motion, making it impossible to hyperextend their arms to survey for available veins.

"The biggest problem is fragile, delicate veins that blow. That means you put a

needle in and automatically get a hematoma forming because their veins are not elastic." In younger adults, Ernst explains, "you put a needle in a vein and the vein kind of hugs the needle, so it provides a seal and the blood will not escape. But elderly patients' veins have lost that elasticity, that reflex, and blood will ooze out between the needle and the perimeter of the hole that you've put in the vein. You might be dead on, and your needle might be perfectly in the center of the vein, but you've got a hematoma forming and you've got to discontinue that venipuncture."

The standard procedure is to try another site, which often produces the same result. That's the biggest difficulty with these patients, Ernst says. Under the CLSI standards, the procedure then is to seek the assistance of another caregiver. "That doesn't mean you have to find someone, but it means you have to go look and determine whether or not anybody with that skill is available. If not, then you're entitled to keep trying." The other difficulty would be when patients are cognitively impaired and unable to cooperate or unable to identify themselves.

Getting the geriatric patient to clench a fist to help the draw may be pointless. "On younger patients, when they tighten a fist, they have a large muscle mass from their shoulder down to the wrist, and the muscles become engorged with blood, and that fills up the vasculature below the tourniquet. But in geriatric patients, their muscle mass is significantly diminished, and when they clench they have much less muscle to become filled with blood, so there's not nearly the benefit." The geriatric patient may be unable to respond to a request to clench anyway because of diminished mental status or hearing loss. A blood pressure cuff can be used for uniform constriction, as long as the phlebotomist limits the cuff to 40 mm of mercury, according to CLSI standards.

If the venipuncture proves difficult because of a hard-to-find vein, pre-warming the antecubital area or rotating the wrist might help distend the vein and make it easier to find. If dehydration might be the cause, sometimes phlebotomists can ask the patient to drink water and return later to do the draw. But there's no way of knowing if dehydration is the issue. "You can tell when their tissues are edematous, because you push down and the tissue does not rise back; you leave an imprint. But you can't tell if they're dehydrated. Asking them to drink some water is a shot in the dark, after you've ruled out other typical scenarios," Ernst says.

A phlebotomist may cause a collapsed vein by using too large of a vacuum tube, he notes. "Whenever you're putting a tube on a tube holder, 100 percent of the vacuum of the tube is transferred to the inside of the vein. If it's a full-sized tube, it could be enough to collapse the vein in geriatric and even in oncology patients." Although the collapsed vein is a temporary condition, very little blood, if any, will flow into the tube. "When drawing with a syringe, you can reverse the collapse by just letting go of the plunger and allowing blood to fill the vein again, then pulling back the plunger at a much slower rate than before." But when using a tube with a tube holder, you are less likely to salvage a collapsed vein, he points out.

Using a smaller-volume tube, which exerts less negative pressure to the inside of the vein, is one way to avoid collapsing veins while using a tube holder. "The forward-thinking phlebotomist anticipates any situation that might arise by stocking the tray with a wide variety of supplies to accommodate different scenarios," Ernst says.

Ernst distinguishes between alternative sites and unorthodox sites for draws. "Not all veins are fair game," he says. "A lot of people out there don't know the limitations that the Clinical and Laboratory Standards Institute puts on site selection and they will choose an unorthodox site like the front of the wrist, which is clearly against standards." But there are acceptable alternatives to the antecubital area, he adds. Examples would be the back of the hand, the thumb side of the wrist, or, with physicians' permission, the feet and ankles.

Usually phlebotomists are not required to physically chart that they were unable to obtain a sample, unless they've completely given up on all the options and they have nobody to go back to. "If everybody who can draw blood in the facility has tried this patient and nobody is getting any luck, then somehow that would need to be communicated to the physician who has to decide what to do next." Sometimes, he says, "you just come up empty."

A flexible attitude is also important when patients are demanding, ornery, crabby, or stubborn, says Ernst. "It's all about professionalism. You have to remain above the fray and in a state of mind that is constantly at the service of the patient regardless of the patient's state of anxiety or temper." Patients do have the right to refuse a blood draw, but phlebotomists need to project a steady purpose: They are there to provide a service even if patients are not sure they need or want that service.

The major issue with oncology patients is the effect of chemotherapy on the body. "Chemotherapy really riddles the veins. It makes them difficult to find, sometimes makes them sclerosed, and diminishes their size and elasticity. And elasticity is important because that's often the hallmark of a vein when we're palpating the site to find one. We feel for something that bounces back. With oncology and geriatric patients, the veins often don't feel typical, and even when we do find them, they've often gotten so small in diameter that even the smallest needles in our arsenal aren't small enough."

Neonates often present the same issue—with the added feature of their being unable to communicate. "So all our skills are technical when it comes to finding veins. In addition, their veins are so underdeveloped, we're limited in the sites we have to choose from. Their antecubital areas—the 'go-to' place for a venipuncture—are usually not as well defined as they are in older children and adults. You often have to default to the back of the hand, and their hands aren't very big."

Drawing neonates requires a phlebotomist to have a gentle touch, steady hands, and an assistant to make sure the baby isn't moving. "You always need someone

there to stabilize the elbow and wrist," Ernst advises. "Never perform a venipuncture from a neonate without assistance. We don't want a moving target when we're drawing blood."

One technique for locating a vein after an antecubital survey has been exhausted is to palpate the site with a finger wetted with alcohol. "I'm not sure if most phlebotomists do wet palpation. It's a technique you won't find in textbooks or mentioned in the standards, but I've found it successful and anecdotally know some phlebotomists use it. There's something about reducing friction on the skin that makes it easier for you to sense the curvature and elasticity of a vein." Sometimes, however, the phlebotomist simply cannot find a neonate's vein and will be forced to do a skin puncture on the heel, and collect blood into a microcapillary or microhematocrit tube.

Bariatric, or obese, people make up an increasingly significant percentage of patients, Ernst says. "It's the way it is in this country, more so than in other countries, and it requires phlebotomists to have additional skills." Chief among those skills is sensitivity. "I do hear about health care professionals being insensitive to bariatric patients, that such patients are not given the same courtesies other people are given." In one survey, 13.2 percent of less severely obese women said physicians made critical remarks about their weight, and 22 percent said they were treated with disrespect because of their weight.

Laboratory professionals may not even be conscious that they are projecting bias. "We just have to be aware that there's a potential that the patient may see some behaviors that show we're not treating them the same as a person of normal weight."

The use of tourniquets on obese patients is one example of how the difficulties of a particular draw can compound. "When you tighten a tourniquet, which is about an inch wide, around an obese upper forearm, the fat tissue tends to make that tourniquet roll up into a ropelike constriction, so it's more like a rope being tied around the arm. It will still constrict the veins, but it's much more uncomfortable."

On top of that, when a tourniquet is left on for longer than a minute, the risk of hemoconcentration rises. "That can occur with anybody, but the problem with obese patients is it often takes so much longer for us to find the vein—maybe going on to two or even three minutes. Then they're more susceptible to the blood in their arm below the tourniquet becoming hemoconcentrated."

Unfortunately, this is an invisible error that the laboratory will never detect. "It will just show as a result that is inaccurate, because a laboratory technologist can't look at it and say, 'Oh, that's hemoconcentrated.' So the lab reports out higher hemoglobins, red cell counts, and a multitude of other falsely elevated results, and the patient is treated according to results that are higher than the actual."

There's no way to reactively fix that problem, Ernst emphasizes. "It can only be proactively prevented by not leaving the tourniquet on longer than one minute prior to venous access." Whenever finding and accessing a vein takes longer than one minute, it should be released and two minutes should be allowed to pass before reapplying it so that the blood can return to a basal state, Ernst says.

Different challenges arise when the patients are drug addicts, in whom scarification of both skin and vein is a common problem. "When an area of the skin is repeatedly punctured with a needle, it will build up scar tissue. Addicts are used to drawing through scarified tissue and veins; it's no big deal to them. But when the phlebotomist has to do it, it's not something they're used to, and when they try to insert the needle and encounter significantly more resistance than with the average patient, what can happen is the vein can roll away from the needle." It can be a little unsettling if the phlebotomist isn't ready for scarification and lacks experience with it, Ernst says.

Among the most common situational challenges phlebotomists might encounter is the needle-phobic patient, says Ernst. And concealing the needle is one of the best techniques. "When you're taking the sheath off the needle, you're shielding it from their view and turning yourself in such a way so that if their eyes are directed toward you, they're not seeing the needle getting prepared for insertion into their arm." Minimizing the sample volume required by using smaller-volume tubes also helps because it gets the patient through the procedure more quickly.

Children in particular are often needle-phobic, just by nature, he says. "Most of the time, watching that needle approach their skin is going to make them even more nervous. So we don't want to give them the chance to watch." Eliminating the visual cue by concealing the needle is one technique. Reducing other procedural cues will also help: "Not making them wait in the waiting room too long where they can hear other children being drawn, or listen to other patients talking about being drawn, or hear the sounds of the laboratory emanating into the waiting room."

Distraction can be highly effective when drawing pediatric patients. "Television and movies do the best job, and that's been confirmed in the literature. Another form of distraction that will work but is not as effective is to have a parent or assistant distract the child with a stuffed animal or some kind of toy or bubbles, or charts they can look at on the wall to pick out a sticker and get them pointed in a direction other than the line of sight of the person drawing blood." Sometimes laboratories can employ colorful panels fixed on the ceiling lights that may look like a cloud or an airplane. "If the child fixes his or her eyes upward, that's perfect, as long as you are out of their peripheral vision."

Ernst is aware of a tactile distraction device called the "Buzzy." It resembles a bee with detachable wings and is battery-operated. "The wings are kept in a freezer until just prior to use," he says. "When a pediatric patient comes in and needs a venipuncture, you attach the wings to the body and strap the device to the arm near the antecubital. When you turn the switch on, the device vibrates mildly. The

vibration combined with the cold sensation from the wings essentially drown out the pain of needle insertion."

Instruments that can detect veins, such as Accuvein AV300, Veinlite, Venoscope, and Wee Sight, could soon become much more common. "Tissue illuminators have been around for a while, but non-contact vein illumination systems are relatively new in the marketplace," Ernst says. The first one came out about eight years ago and cost more than \$20,000. Devices have since shrunk and become less costly. The handheld Accuvein AV300 came out in 2009 and costs about \$4,000. "They're a long way from being used in every facility, but I think they'll become more and more widely accepted because of their portability and cost-effectiveness."

Despite the many precautions phlebotomists can take, in Ernst's experience about three to five out of 100 patients will have a violent reaction to a venipuncture. "Unexpectedly, the patient just reacts adversely, and you have to be ready. If you expect that everybody has the potential to react that way, then you're always ready. You've got to have the presence of mind to do what's necessary to protect the patient as well as yourself, such as releasing the tourniquet quickly and getting the needle safely secured."

But phlebotomists can minimize those risks as well as the risks of difficult draws by correctly stocking their trays for different kinds of patients and being mentally prepared for the unpredictable, Ernst says. "That's the nature of health care. Every phlebotomist has to expect the unexpected."

Anne Paxton is a writer in Seattle. The Center for Phlebotomy Education's "Phlebotomy Channel," an online video streaming platform, will soon include a lecture on difficult draws.



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Lopez v. Brewer, No. 12-16084 archived on May 25, 2012