May 2016 (Volume 17, Number 5)
Institutional Subscription

PHLEBOTOMY TODAY
A monthly newsletter for those who perform, teach and manage blood collection procedures from the most respected authority on the planet.

Journal Roundup

This month and next, Phlebotomy Today is rounding up new studies and articles that have been published in the last 12 months pertaining to blood specimen collection. Phlebotomy is an ever-changing industry. We live in the literature and make it our job to see that you are kept informed. While you’re doing what you do best, so are we.

Cardiac patients losing two units of blood just for lab draws

Cardiology Today reports patients undergoing cardiac surgical procedures lose the equivalent of two units of red blood cells just from phlebotomy draws for laboratory testing. Nearly 1900 patients undergoing cardiac surgery were assessed for blood loss by researchers who found they lost an astonishing 454 mL of blood (median) during their hospital stay by diagnostic blood sampling alone. Patients undergoing cardiac bypass procedures and valve procedures at the same time were tapped for 653 mL. Patients having bypass alone were drained of 448 mL. Patients in the ICU had a median of 332 ml removed for lab testing versus 118 mL for patients outside those units. Not surprisingly, 49 percent of patients in the study received transfusions.

Read the abstract.

Spanish hospital logs 13 percent preanalytical error rate

Researchers at a Spanish Hospital evaluated five years of data to determine their facility’s overall preanalytical error rate, including critical errors. After assessing over 750,000 requests for laboratory analyses, the facility found they had a total rate of sampling errors of 13.5 percent. All samples were collected and processed by nursing personnel at the facility and its 19 clinics and outpatient draw stations. Errors included hemolysis (8.8 percent of all samples), clotted samples (1.4 percent), incorrect container (0.08 percent), insufficient sample (0.35 percent), sample not collected (2.96 percent).

Among the errors, 287 (0.05 percent) were classified as "critical" with severe consequences for the patient. Half of those were determined to be samples collected from the wrong patient. On two occasions, samples from two pediatric patients were combined in the laboratory to increase sample volume.

Read the study.

Laboratory industry under scrutiny

A scathing investigative report published in November impugned the laboratory industry for being self-regulated and failing to protect patients from serious injury and death. Lapses found during a spot inspection at one hospital by federal regulators recently led to the partial closing of its laboratory. The Milwaukee (Wisconsin) Journal Sentinel report was highly critical of the laboratory industry’s lack of control over routine testing. The article highlights one patient who received a false-positive HIV result because his samples were not labeled in his presence, and were ultimately mislabeled. In another case, an inaccurate prenatal screening test failed to detect Rh incompatibility between the mother and the baby. The lack of a diagnosis deprived the infant of prenatal care that could have prevented the infant’s death at 3 weeks.

Three months after the facility passed an independent inspection by the College of American Pathologists (CAP), federal regulators found expired blood bank reagents used for compatibility testing, evidence of improper training, violations in proficiency testing, inadequate competency assessments, and a lack of documentation that employees were qualified for their positions.

Full story.
Accuracy of single-drop blood tests questioned

Test results from a single drop of blood may not be as reliable as we think. Researchers at Rice University’s department of Bioengineering collected six consecutive drops of blood into separate containers from 11 subjects. Each sample on each patient was tested for hemoglobin levels, WBC counts, differentials, and platelet counts. The drop-to-drop variation was up to three times greater for hemoglobin than for samples collected by venipuncture when repeatedly tested on the same instrument. Variability was 5.7 times greater for WBC counts, 3 times greater for lymphocyte counts, 7.7 times greater for granulocyte counts, and 4 times greater for platelets.

Read the study.

European compliance with CLSI standard shaky

The CLSI venipuncture standard (GP-41-A6, formerly H3-A6) is not as widely implemented in Europe as many would think. Twenty-nine provisions of the standardized procedure were assessed at facilities in 12 European countries in an observational study. Twenty-seven percent of the observed procedures failed in at least one of the provisions.

The two steps with the least compliance were inspecting supplies for their expiration dates (72 percent non-compliant) and assuring patients didn’t bend their arms upward as a substitute for pressure (69 percent). Selecting a suitable venipuncture site had the most compliance at 99.7 percent. Half of those observed were nurses with the remainder comprised of laboratorians, physicians and administrators. In the critical aspect of patient identification, the nine physicians observed were all compliant with the standard protocol. The 12 administrators observed were 75 percent non-compliant. Physicians did not adhere to test tube labeling policy 65 percent of the time.

Read the abstract

Uncomplicated venipuncture clocked at 4:19 per patient

In an effort to establish productivity benchmarks, authorities at several Calgary hospitals timed how long properly performed venipunctures take without complications. The mean was four minutes, nineteen seconds, not including transit time to and from the patient’s location. The procedure was timed beginning with the pre-contact hand hygiene step and ending with the second hand hygiene step after the draw was complete. Calculating a 52-second standard deviation, the facilities were able to recommend productivity at ten patients per hour.

Read our summary in the March issue of Phlebotomy Today-STAT!

Study assesses drones for sample transport

Researchers collected paired tubes for chemistry, hematology, and coagulation from 56 adult volunteers, transporting one set by drones and the other set by vehicle to the same testing laboratory. Upon arrival each sample was tested for a wide variety of chemistry, hematology and coagulation tests and compared. The study concludes results from drone-delivered samples were not significantly different from those transported by vehicle. However some analytes transported by drone demonstrated slightly poorer precision (repeatability) for some tests.

Full article

Hospitals punished for poor progress on infections

Over 750 U.S. hospitals that haven’t gotten their act together on controlling healthcare-acquired infections (HAIs) are facing fines of $364 million in healthcare reimbursements in 2016. The U.S. Centers for Medicare and Medicaid Services (CMS) levied the fines, which constitute a one-percent payment reduction to the Medicare payments it will make to those facilities over the next year. Those penalized represent the worst performing 25 percent of hospitals in the U.S. in reducing HAIs. Approximately 54 percent of those on the list were also on last year’s list of worst performers.

Full story

Hungry for more? Next month we’ll continue our roundup of new studies published in the last year. If you want to look back even further, view our last Journal Roundup, published in the March 2015 issue of Phlebotomy Today’s sister publication, Phlebotomy Today-STAT!
On the Front Lines: Blood pressure cuffs as vein-finders

Dear Center for Phlebotomy Education,

We are debating the merits of using blood pressure cuff vs. vein finders for patients whose veins are not palpable. We used to use blood pressure cuffs in the past with great success, but once the cuff broke down they were never replaced. Since we are on a tight budget I think the BP cuff would be the better alternative to the more expensive vein finders. What is your opinion on this?

Our Response:

Using blood pressure cuffs as an alternative to vein finders is certainly an interesting adaptation of old technology, but it appears some at your facility are finding it successful. I suspect it’s because inflated cuffs are being left on for longer than one minute, causing deep veins to distend to an extent they become palpable. There are a couple of concerns here. Prolonged constriction is causing hemoconcentration, which will alter test results. Make sure those using this technique are deflating the cuff for at least two minutes before the draw, just like they should when tourniquets are on longer than one minute. The other issue is that the cuff should not be inflated above 40 mm Hg, according to the standards.

Neither of these are concerns when using a vein locating device. However, we understand the expense involved. The best one we’re aware of runs around $3000. There’s the tissue illuminators, which are less costly, only several hundred dollars. You might try having your staff employ low-tech strategies like prewarming the antecubital and lowering the limb to help it fill up and distend the veins.

Product Spotlight: Poster depicts impact of preanalytic errors

Do those who work with you and for you scoff at the many details you know are critical for every venipuncture? Do you need something that reinforces the importance of every step to your students and new hires? We thought so.

That’s why the Center for Phlebotomy Education just released a new poster that connects the dots between preanalytical errors and patient outcomes. Blood Collection Errors and Their Impact on Patients is a 20 x 28-inch laminated chart listing over 40 errors that can be committed during the collection, transport, and handling of blood samples. A corresponding column lists the impact each error can have on the test result and patient. Examples include:

- **ERROR:** Delay in transporting/testing coagulation specimens
  - **POTENTIAL IMPACT:** Stroke, thrombophlebitis, and pulmonary embolism caused by unwarranted modification to blood thinner dosage based on inaccurate aPTT result.

- **ERROR:** Improper mixing
  - **POTENTIAL IMPACT:** Patient mismanagement due to delays when anticoagulated tubes contain clots and must be recollected.

- **ERROR:** Patient misidentification
  - **POTENTIAL IMPACT:** Transfusion- or medication-related death. Misdiagnosis, medication error, and general patient mismanagement due to being treated according to the results of another patient.

- **ERROR:** Filling tubes in the wrong order
  - **POTENTIAL IMPACT:** Seizure and death from potassium carrying over from EDTA into tube to be tested for K+. Medication errors when additives carry over into coag tubes, falsely lengthening coagulation times and leading to unwarranted and life-threatening medication adjustments. Unnecessary antibiotic administration and prolonged hospitalization due to contaminated blood cultures.

- **ERROR:** Pouring blood from one tube into another
  - **POTENTIAL IMPACT:** Patient mismanagement/misdiagnosis & medication errors based on altered results, especially potassium. Stroke/hemorrhage due to unwarranted modification to blood thinner dosage.

- **ERROR:** Underfilling heparin tubes
  - **POTENTIAL IMPACT:** Patient mismanagement and/or misdiagnosis from altered potassium, sodium, ALT, AST, amylase, and lipase results.
This is a posterized version of one of the Center’s SmartCharts™, a series of desktop reference materials in pdf format available for downloading at www.phlebotomy.com and free to all Phlebotomy Central members. Posting the Errors/Impacts poster in prominent areas provides poignant evidence to the entire staff of the importance of every step of blood collection, handling, and transportation.

For more information and to purchase.

From the Editor’s Desk

You know me well enough by now to know I’m a good husband. I do whatever my wife asks and I let her do whatever her heart desires. This is as it should be. Mind you, my wife would never ask me to do anything she thought I might object to, nor would she ever do anything I would take issue with. That’s the definition of a solid marriage. So naturally, when she sprung her latest endeavor on me, I just nodded my head and said "As you wish, Buttercup."

As we sat on our deck one evening recently rocking in our Amish rockers, she made her calculated announcement. "We’re going to be beekeepers," she said. I have to admit, I didn’t see that coming. It sounds peremptorily painful to me, but she assured me it’s necessary for our ever-expanding orchard and monstrous garden.

"But we don’t know anything about beekeeping," I said. She convinced me she already has her brain around it and we could learn the finer points to bee husbandry together. Buttercup is nothing if not fearless. There’s not much she can’t do, or learn to do. I just kept rocking and listening.

It seems some family members in the area who keep bees were moving to Alaska and can’t take their hives with them. Buttercup gladly offered to take them and raise them as our own without consulting me. Mind you, she knew I wouldn’t object. Why would I? I didn’t object in 2003 when I returned from a conference in Salt Lake City to find we were suddenly raising chickens. Not only had she built a fine chick house in my absence (with my tools, no less), but populated it with a dozen needy, cheeping chicks. At that point, all a good husband can do is compliment her on her fine craftsmanship in constructing their abode. We’ve had chickens ever since.

Buttercup made arrangements for us to pick up two hives before dawn in late March. It seems the best time to move bees is before they’ve had their coffee. So we snuck up on them in the dark of night, immediately taped shut their one and only exit, and gingerly loaded them into the pickup. By daybreak we had them unloaded at their new home near our orchard and quickly reopened their exit. Then we ran like our pants were on fire. Not one chased us. Not one even seemed to care.

Over the weeks that followed, we've grown more and more comfortable having them in our yard, even walking and mowing around their hives unprotected. Bees won't bother you unless you are perceived as a threat. Merely walking around their hives, even mowing around them, doesn't threaten them. They're more intent on making a beeline to the nearest bloom and back than on taking down every bipedal that walks or mows by. Stand in their path and you'll likely have a bee slam into your forehead. Thoink! They just ricochet off and keep going. I now know there’s no need to run or even jump when that happens. When you’re a bee, pollen is far more interesting.

But you can’t keep bees without getting into their hives now and then to conduct an inspection. This looks a lot like a home invasion to bees, so suits are required, preferably impenetrable to stingers. What you don’t want is for the hive to get so crowded, the colony splits, taking the queen with her. The only way to find out is to dismantle their apartments from top down and visually inspect. Try this without a suit and you're soon sorry. Walking by a hive is one thing; taking it apart is another, and identifies you as an intruder. Our suits are pure white and tightly woven with not one point of entry from head to sole. When we first put them on we felt like a couple of Ghostbusters all suited up to battle poltergeists. You move slowly when dismantling a hive. It's disturbing enough without fast movements. The sentries will swarm around you, but you have to trust your suit. If you put it on right, you need not worry. So far, we've never been stung.

Of the two hives we brought back to Run-A-Muk Farm, one did not survive the winter as it turned out. It seems beetles had gotten in and ate all the honey the colony had stored up for the off-season. But it really didn’t matter because the first time we suited up to inspect the remaining hive we found they were already creating a second queen and preparing to find new quarters. Fortunately, we had the second hive cleaned by then and quickly launched into advanced beekeeping: splitting the hive. Buttercup was right; so far we’ve figured out how to keep bees successfully and to grow the supply of pollinators for our orchard and garden. We now have a third hive loaded with a colony of honeymakers acquired from a local beekeeper. We look to be in the honey come August.
So far, the chickens don't seem to mind the new occupants of our homestead. Their scratching nearby doesn't stir them up, but then we're not there all the time so we don't know if any lessons have been taught about proximity or not. All we know is they coexist, at least in our presence. Just like chickens, we will probably always have bees, so they better just learn to get along.

It's hard to imagine what adventure Buttercup will bring to our property next. So I have to be ready for anything. She makes life interesting, there's no doubt. She likely already has several ideas already sprouting in her fearless mind about what we can't live without much longer. She's already hinted at harvesting sap from our trees and making maple syrup. She knows not to bring home any goats, cattle, alpacas, or any other cud-chewing animal with split hooves, though. (If she didn't, she does now because I know she reads my editorials.) Everything else is probably fair game, and she knows it.

The bees will keep her learning for a while, though in time a new challenge will be necessary. When the time comes I'll just sit in my Amish rocker, nod my head in acceptance, and lovingly proclaim "as you wish, Buttercup."

Respectfully,
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Sticks, Staph, & Stuff: Capillary risks
As a healthcare professional, one of your greatest risks is of being exposed to pathogens. Your patients face the same risk. Each month, Sticks, Staph & Stuff will discuss ways you can protect yourself from a bloodborne-pathogen exposure and your patients from exposure to pathogens you're capable of transmitting that can lead to healthcare-acquired infections (HAIs).

Most healthcare professionals who draw blood samples are aware of the risk of accidental needlesicks when performing a venipuncture. But what about skin punctures? Just because we can't see the needle, doesn't mean it doesn't pose risks. If you perform capillary punctures, keep in mind your technique and devices, which may be putting you in line for an unexpected exposure during a skin puncture.

Using non-retractable devices—With the wide variety of retractable models on the market, there's really no good reason not to use them. Cost is not a good reason. In fact, in the U.S., retractable devices are mandated by OSHA. Everywhere else, it's just smart. If you were to Google images of "lancet", you'd see dozens of makes and models. Obviously, the more dangerous non-retractable devices are available, but think twice before using them. Once employed, they are armed and ready to infect you with whatever pathogens the patient upon whom it was used might have. Don't assume he/she is pathogen free. Most of the up to 200 million people in the world who carry the hepatitis C virus are asymptomatic. If you use any of the devices pictured at the right when performing skin punctures, bring their risk to the attention of your manager or educator immediately and urge they be discarded and replaced with a retractable alternative immediately. Doing so not only protects the user, but all who handle sharps waste.

Puncturing the earlobe—Earlobes are thin. So thin on some patients, performing a skin puncture here could penetrate through to the other side. If the finger of the person performing the puncture is in harm's way, it becomes an accidental needlestick. Skin puncture devices can be up to 4.0 millimeters, but more commonly are 1.8-2.5 mm. Depending on the patient, even retractable capillary puncture devices can penetrate an earlobe, putting the unwary collector at risk. The CLSI skin puncture standard lists earlobes as a restricted site for skin punctures.

Blood exposure to unprotected skin—capillary collections are considered "open" collections. Blood from skin punctures poses an immediate threat of contact as soon as it emerges from capillary beds. Not so with venipunctures in which blood goes from vein to tube or syringe, making it a closed collection. Because capillary collections are open collections, those who sample capillary blood must have their skin protected at all times. The fingers holding collection devices are mere millimeters away from contact with emerging blood and the pathogens every drop may contain. We all have microscopic breaks in our skin we don't even know about, providing a port-of-entry into our circulatory system. Wearing gloves during all skin puncture collections provides the necessary barrier to exposure. (Note: Just because venipunctures are closed collections doesn't mean gloves are not required. The risk of exposure is different, but no less significant.)
High-powered Talent: Peers versus past

High-powered Talent is intended to inspire employees to become the one asset on staff their managers can't imagine working without and the one professional every patient hopes will draw their blood.

Mediocre talent compares itself to its peers. High-powered talent compares itself to its past.

When a person's self-image uses those around her as her benchmark, it's a flimsy standard. If all one has to do to feel more polished, professional, astute, competent, and valued is to appear more so than those who surround her, what if she's surrounded by malcontents and slackers? Being better than dysfunctional is not much of a challenge and brings little notice by her employer. It takes very little effort for dandelions to rise above crabgrass. At the end of the day, they're both weeds most homeowners would rather eradicate.

But when a person uses herself as a benchmark, the standard has meaning. Comparing yourself to the degree to which you were polished, professional, astute, competent and valued last month or last year demands a constant striving. Forgetting about what grows (or sucks the energy) around you and focusing on how to become a better version of yourself gets noticed every time. Some of the most coveted flowers in anyone’s garden emerge looking a lot like weeds in the spring. Over time, they grow taller and gain features that set them apart from those around it that merely consume nutrients and choke out the ambitions of those destined for a greater purpose.

Every day they become better than the day before, which is precisely their goal. They care not one iota about how they compare to those surrounding them; they just want to be better than who they were. They want to achieve their potential, the potential with which they were born, not that determined by those around them.

Mediocre talent compares itself to its peers. High-powered talent compares itself to its past.

Print and post an attractive pdf defining High-powered Talent.

What’s Wrong Here?

What's wrong with this picture? (Click image on the left to enlarge.) We guarantee something isn't as it should be. The answer will be in next month's issue.

Last month's image depicted a patient on a gurney being drawn using a vein-anchoring technique known as “the C-hold” or “the two-finger stretch.” Call it what you want, but we call it dangerous. With the index finger above the intended puncture site, all the patient has to do is jump and the needle inserts the wrong person's flesh. Or perhaps the collector gets bumped from behind by a caregiver working on another patient on the other side of the curtain. Instead, anchor from below the intended puncture site only. It's a safer alternative.

If you look closely, there's a second error in this image as well. There appear to be two other tubes on the gurney next to the patient’s arm. Although it's difficult to tell if there's blood in the tubes or not, if the collector is indeed anchoring the vein and inserting the needle as it appears, the two tubes are likely unfilled. The tube in the tube holder is a heparin tube with gel and should be next to last in the order of draw, not first.

Tip of the Month

Each month we post a "Tip of the Month" on our web site from our rich library of archived Tips.

This month's Tip: "Of All the Nerve"
CE Questions

1. What's wrong with the picture in this month's "What's Wrong Here?" column? (fill in)

_______________________________________________________

2. When using blood pressure cuffs as an alternative to tourniquets, one should:
   a. calibrate the cuff
   b. inflate to 40 mm Hg
   c. release within one minute
   d. b and c

3. Results from six consecutive drops of blood in one study showed:
   a. no significant variability
   b. variability between hemoglobin and glucose levels
   c. variability between platelets, granulocytes and lymphocytes
   d. variability between all hematology and chemistry levels

4. Researchers in Calgary timed the duration of uncomplicated venipunctures and established a recommended goal of:
   a. drawing one patient every ten minutes
   b. drawing four patients every hour
   c. drawing one patient every 4:19
   d. drawing ten patients every hour

5. Delay in transporting/testing coagulation specimens has the potential impact on the patient of:
   a. hemorrhaging due unwarranted medication modification based on falsely prolonged aPTT result
   b. stroke, thrombophlebitis, and pulmonary embolism caused by unwarranted modification to blood thinner dosage based on inaccurate aPTT result
   c. Unnecessary antibiotic administration and prolonged hospitalization
   d. none of the above

6. Filling tubes in the wrong order has the potential impact on the patient of:
   a. seizure, death, and blood culture contamination
   b. medication errors
   c. unnecessary antibiotic administration
   d. all of the above

7. A study published in Cardiology Today assessed nearly 1900 patients undergoing cardiac surgery and found they lost a median of _______ of blood during their hospital stay by diagnostic blood sampling alone.
   a. 366
   b. 127
   c. 544
   d. 454
Answer's to last month's Quiz (April):

1. Anchoring above and below the puncture site, incorrect order of draw
2. b
3. c
4. a
5. d
6. d
7. b

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