

How to Prevent Nerve Injuries From Venipuncture



The radial nerves can be injured during a venipuncture procedure. Illustration by Sally Menes

Avoiding nerve damage when performing a venipuncture requires using correct procedure during the blood draw. Venipunctures, performed correctly, carry a low risk of any type of injury.

An understanding of human anatomy (the location of nerves adjacent to veins) and the ability to successfully enter a vein using the fewest number of attempts will minimize this risk even further.

This type of expertise comes from years of study and practice, but there are best practices to keep in mind at any point in your phlebotomy career to prevent damaging nerves.

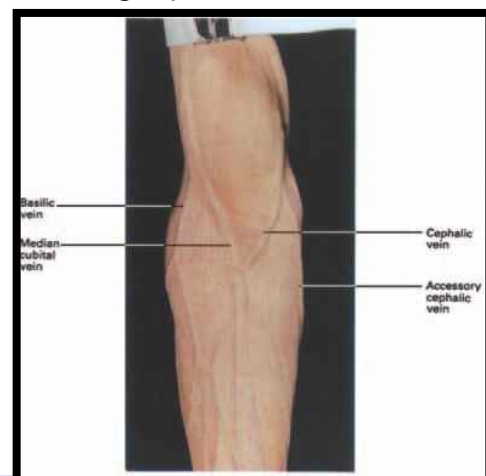
Choose the venipuncture location carefully. There are areas of the body that carry higher risk of hitting or damaging nerves than others (for example, the inside of the wrist).

Use proper venepuncture technique. Palpate and locate the vein thoroughly before entering with a needle. Note the direction and depth of the vein and use an angle of needle entry appropriate for that vein.

Pull the skin taut and anchor the vein with a gloved finger before you enter the vein. This will minimise your risk of "missing" the vein and hitting a nerve (or causing a hematoma).

Listen to and watch the patient. If you hit a nerve, the patient may jerk his arm or describe a shocking pain. If your patient reports this, immediately stop the procedure and remove the needle.

Instruct the patient to elevate his arm and use ice and light pressure on the site.

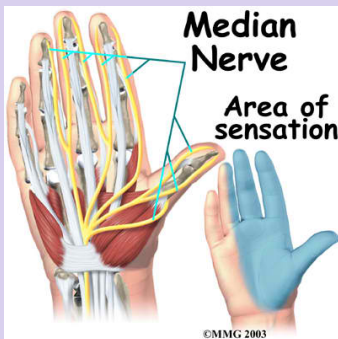


Tips and warnings

Permanent nerve injuries are preventable by avoiding high-risk superficial nerve areas for venipuncture and by frequent documentation of IV site assessments.

Nerve injury related to venipuncture is one of the most common areas of nursing malpractice, in which the nurse or phlebotomist is identified as the primary defendant.

Remember - listen to the patient! Remove the IV device or needle immediately if the patient has symptoms of nerve contact during venipuncture, and avoid high-risk nerve injury areas.



If you fear that you may have hit or damaged a nerve, document the procedure completely using your company or laboratory's reporting system.

Do this as soon as you can in order to document as many details as possible.

Incidence

While no studies of overall injury rates from phlebotomy procedures exist, The New York Times mentions that some advisors have made a career out of teaching health care personnel to avoid getting sued by patients over botched phlebotomy procedures.

Medical professionals can also receive injuries from phlebotomy needles themselves.

A 2003 EPINet report revealed that 5 percent of all sharp-instrument injuries in medical facilities occurred from phlebotomy needles, and 94 percent of those incidents involved needles still filled with blood, posing a risk of infection.

When it Happens

Even if all of the precautionary measures have been taken and you suspect that a nerve injury has occurred, then knowing the signs and symptoms are crucial.

If these symptoms occur with a blood draw, a person should contact the lab supervisor/tech or possibly present to the emergency room for instructions and documentation of injury. Application of cold/then warm compresses to the area may help; however, the symptoms usually dissipate as no real cure exists to an injured nerve. just time itself.

The patient may relay useful information that a nerve injury has occurred if he or she indicates any of the following symptoms:

- sharp acute pain at the venipuncture site
- sensations of pain that can fluctuate in severity according to needle position
- description of "pins-and-needles" sensations or "an electric shock" in the arm the venipuncture was performed
- pain that moves up or down the arm during or immediately after the venipuncture
- pain or tingling discomfort in the hand or fingertips
- a scream or non-verbal pain communication during needle entry

Phlebotomists are advised to be careful when choosing veins and to make sure that they are "in the vein" and have not gone through it and that they are trained not to spend time "fishing for a vein" (moving the needle around after insertion to try to locate a vein).

Be sure you know where you are going before you insert the needle. A slight move may be necessary, but only to reposition if the needle has hit the wall of the vein rather than the lumen, but nothing more.



"Nurse, I feel an electric shock going down my arm." Would this patient complaint mean anything to you when you insert an IV catheter or draw blood? This feeling of shock is a classic symptom when a needle point makes contact with a nerve. It could result in permanent nerve injury - and malpractice litigation involving the nurse performing the procedure is not uncommon.

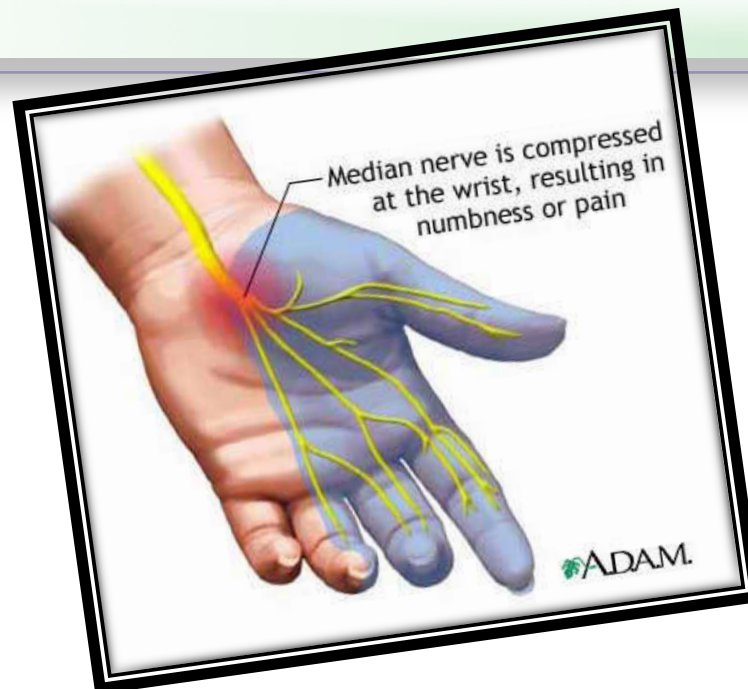
The two nerves most often injured during a venipuncture procedure are the radial and median nerves. The radial nerve passes along the thumb side of the arm, from the shoulder down into the wrist area, and is in close proximity to the cephalic vein. In a venipuncture procedure, the cephalic vein is often the vein of choice for many clinicians.

The distal three inches of the radial nerve, just above the thumb, is the area most often injured during the insertion of peripheral IV devices.

The median nerve is the largest nerve in the arm. It runs inside the antecubital fossa and passes through the forearm into the palm of the hand. When nurses are drawing blood from the antecubital fossa or inserting peripheral IV devices, they could contact and injure this nerve. Insertion of IV catheters into the superficial veins of the inner aspect of the wrist above the palm of the hand can result in serious injury to the median nerve and carpal tunnel syndrome.

If a patient complains of an electric shock-type sensation radiating down into his or her hand as the needle is being inserted, the appropriate intervention is to remove the needle immediately. The outcome will be minimal nerve damage without permanent injury; however, if the nurse continues to advance the needle farther into the nerve, a permanent, progressive, and painful disability resulting in reflex sympathetic dystrophy (RSD) or complex regional pain syndrome (CRPS) can result. Patient symptoms can include a mottled and cold hand and forearm, hypersensitivity to temperature changes, excessive nail and hair growth, and the inability to lift heavy objects. CRPS is diagnosed by patient history and nerve conduction studies. Treatment options include long-term pain control with narcotics, multiple nerve blocks, and even implanted morphine pumps, as well as splints, casts, and TENS (transcutaneous electrical nerve stimulation) units.

Best practice mandates that you avoid areas of high-risk nerve injury by using land-marking techniques. The three-inch area above the thumb and the three-inch area on the inner aspect of the wrist should always be avoided, since the radial and median nerves can be superficial in these areas. The risk of permanent nerve injury outweighs the benefit of IV or needle insertion in these areas.



Injuries to nerves during routine venipuncture can be quite a painful process for both the patient and phlebotomist alike.

The physical pain endured by the patient can have long lasting, if not permanent, effects, and the phlebotomist who caused the injury may have to cope with the mental and financial pains of dealing with a lawsuit.

It is critical, then, for phlebotomists to know the types of nerve damage that can occur, how to prevent injury from occurring and the symptoms of nerve damage.

Types of Nerve Damage Injuries:

1. The first, nerve nicking, can occur because a major nerve lies near every major vein of the arm. A nicked nerve usually occurs when 'probing' is done by the tech who has missed the vein and is attempting to just dig for it. The nicked nerve usually causes an immediate 'pins and needles' or numbness feeling along the area of the stick or even can [feel] as an electrical-type tingling running up and down the arm or in the fingers of the arm being used for the venipuncture.
2. The second injury that can occur can be a nerve compression injury, either by a hematoma in subcutaneous tissue, by infiltration of intravenous fluid or when the tourniquet is left on for too long or is too tight. The swelling and numbness from nerve compression injuries usually does not occur for 24-96 hours.

Prevention

To prevent these two types of injuries, the following measures are suggested:

Choose an acceptable site. Median cubital is the first choice if it is available.

Identify the most prominent of the acceptable veins: median cubital, basilic and cephalic.

If the arm is unavailable or none of the above are easily accessible, then investigate the dorsal hand veins.

Avoid veins in the wrist.

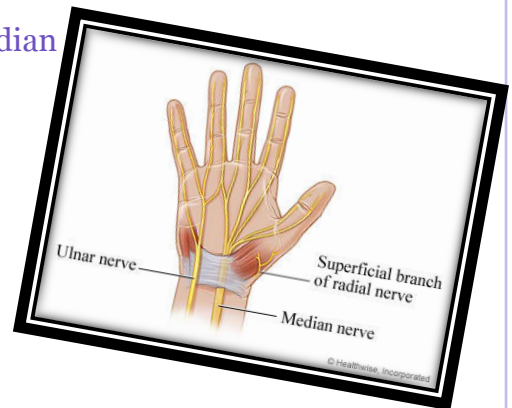
Do not probe.

Do not make an excessive number of attempts. Two is the recommended number of attempts. Follow your facility policy.

Retract the skin and stabilize the vein.

Insert the needle at approximately a 15-degree angle.

Recognize the signs and symptoms of nicking the nerve.



To avoid nerve damage, choose the vein site carefully, do not use the inner anticubital and if at all possible, always use the outer vein or the middle one. The inner also runs along with the artery, which also should be avoided.

Do not probe. If you miss, you miss. Withdraw and try again, but no more than two sticks per tech. No wrist veins are to be used, ever, and finally, always prevent hematomas.

A hematoma can result from uncontrolled bleeding at the site or from inadequate pressure at the site after the needle is removed from the vein. Anticoagulant patients are at risk for hematomas.

'A Little Sting' Can Become a Debilitating Injury

(A PATIENT'S STORY – By Leigh Wells)

Two things stood out on the day of the blood draw: the streets were flooded from a three-day downpour (not common in my desert town), and the needle hurt a lot more than usual.

Like most of us, I'd been stuck dozens of times in my life without protest, but this time I glared at the offending instrument and said to the technician: "Ow, ow, ow! Are you using a really big needle?"

The phlebotomist assured me everything was fine: "Maybe a little alcohol got in there and made it sting."

I drove home through the cloudburst and, a few hours later, peeled off the pressure bandage on my arm. Blood was still oozing from the puncture site. I put on a fresh Band-Aid and didn't think anything of it. It was only a blood draw.

In the following days my right arm throbbed as if it had been tenderized with a baseball bat. I held a pen clumsily, and my notes took on a drunken cast. I didn't know it at the time, but my penmanship was destined to get much worse.

Over the next months the pain eased if I rested my arm, but it always came back: an aching in the inner elbow, numbness in my little finger and a sensation of cold in my hand. Eventually I had to give up swimming laps, and I could type and drive only in sprints. I made forays to doctors to find out what was wrong — with inconclusive results — all the while thinking this was a temporary injury and it had to get better.

But a year later I couldn't address an envelope without pain and needed help cutting a waffle. The most common and most seemingly harmless invasive procedure in medicine is not always harmless, I had discovered.

There are no studies showing how often patients are hurt during routine blood draws, but a 1996 study of blood donors (a larger needle is used in blood donation than in routine venipuncture) found that 1 in 6,300 donors suffered a nerve injury.

Phlebotomy-related injuries have become common enough in recent years that there are now specialists who make a living teaching health care providers how to avoid lawsuits provoked by the procedure. (A lawsuit I filed as a result of my own injury was eventually resolved.)

Dennis Ernst, director of the Center for Phlebotomy Education, says the risks of the procedure include nerve injuries and [chronic pain](#) syndromes that can render you disabled for life. He likes to warn patients that some technicians have only a weekend of training — practicing on a dummy arm on Saturday and sticking your vein on Monday.

California, where I live, is the only state where phlebotomists must be licensed (although not the case at the time of my blood draw three years ago). But even then things can go wrong. After all, we're talking about hard steel entering soft flesh in an area of the body — the inner arm — rich in nerves and arteries.

If something does go wrong, patients have an added problem: very few health care providers have ever heard of phlebotomy injuries.

I eventually found an arm surgeon, Dr. Trevor Lynch at the Southern California Orthopedic Institute, who was able to explain my pain: the needle had gone through my vein and caused dangerous but invisible bleeding into my arm.

(Another common injury is caused by a direct hit to a nerve, producing an electric shock feeling in your arm or hand.)

Dr. Lynch recommended surgery to prevent permanent loss of the use of my arm, as well as a condition called "claw hand" that causes your digits to curl up like a sea anemone. Seeing that my little finger was already starting its inward curl, I made the appointment.

After surgery to repair damage to my ulnar nerve, tendon and bone, I was hooked up to two pain pumps and lived for months on a [diet](#) of pain pills and patches.

Reduced to taking notes and eating with my clumsy left hand, I routinely watched in childish frustration as food dribbled off my fork.

Today, I'm back to swimming laps, but my elbow aches if I type for too long or curry the dog with vigor. I've become an evangelist on the potential dangers of phlebotomy, rolling up my sleeve at every opportunity to display my six-inch scar and telling people to take unusual pain or prolonged bleeding at the time of a blood draw seriously.

If you think you've been injured, the first rule is to have the technician remove the needle immediately. Then seek help relentlessly.

Types of Phlebotomy Injuries

Many phlebotomy injuries take the form of nerve damage.

According to The Washington Post, a phlebotomist can miss the vein and inject a nerve instead, causing painful or paralyzing damage to the affected limb.

Other types of injury occur when the needle goes all the way through the vein, punctures an artery or bruises the vein, any of which can cause serious internal bleeding.

According to The Washington Post, phlebotomy patients can receive injuries not directly related to the needle such as passing out and hurting themselves in a fall.

Complications

Nerve damage from an improperly administered blood draw can result in a condition known as "claw hand," according to The New York Times.

Fingers on the affected hand begin to curl up, eventually rendering the hand useless.

Severe cases can lead to loss of function throughout the arm.

According to the Journal of Brachial Plexus and Peripheral Nerve Injury, in some cases patients can experience shooting pains through the arm and numbness to outside stimuli.

Reasons

According to The Washington Post, unlike other medical skills, in many states phlebotomy does not require specialized training.

Many medical personnel performing phlebotomy procedures have received little training, leading to incorrect administration of blood draws and injuries to patients.

Even an experienced phlebotomist can sometimes have trouble finding or isolating a vein.

Mechanism

Phlebotomists use a procedure called venipuncture to obtain blood samples from patients.

With the patient seated or lying down, the phlebotomist ties off the patient's extended arm with a tourniquet and selects the vein for blood draw.

The phlebotomist then inserts a hollow needle into the vein at an angle, draws the sample and quickly removes the needle.

According to the University of Utah's Spencer C. Eccles Health Sciences Library, to avoid bruising or other tissue damage the phlebotomist must puncture the vein's center without digging or probing.

Conclusion:

Medical technicians can benefit by adhering to the set standards of the NCCLS procedures of blood draw and by understanding their scope of practice and expertise, maintaining training and proficiency, by having the patient hold the puncture site for at least 2 minutes and by pressure bandaging.

Phlebotomists should also "document, document, document the happenings of and around the venipuncture and occurrences. It's good to document, even clean draws and no problems - because the symptoms of a blood draw gone wrong are not always immediately apparent.

References



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Of all the nerve: Nerve injuries and information the phlebotomist must know.