Prevention of needle stick injuries

Gregory M. Ness, DDS

Dr. Ness is associate professor and clinic director of Oral and Maxillofacial Surgery at The Ohio State University College of Dentistry.

The Ohio State University (OSU) College of Dentistry, as part of the OSU Health Sciences Center, follows a fairly strict protocol for addressing student and staff parenteral exposures to patient blood or body fluids. Part of the protocol involves regular review of all such occurrences with the hope of identifying any particularly risky activities. The intent is that once it is identified as high risk, an activity can be avoided, made safer, or identified as injury prone and approached more cautiously by all involved. Through this process, we recently identified a cluster of injuries involving care of used dental local anesthetic needles. As a result, the observations and recommendations below were disseminated to all our faculty, staff, and students.

At the end of a dental procedure it is necessary to remove and discard all sharps, which includes unscrewing the needle from the dental syringe. This is done by twisting the capped needle to unscrew it from the syringe hub, either with a heavy instrument such as a needle holder or simply by using one's fingers. One must be careful not to pull on the cap and accidentally dislodge it. The needle should be completely unscrewed from the hub without pulling, because pulling will remove the cap and expose the used needle.

Sometimes, instead of the needle unscrewing from the metal syringe hub, the hub loosens and comes unscrewed from the syringe barrel. Once the hub has come loose from the syringe barrel it is nearly impossible to remove the needle alone. It is dangerous to attempt to do so, because the attempt usually involves excessive uncontrolled force and/or pulling on the needle cap. When the hub loosens, it should be managed by first completely unscrewing the needle-hub assembly from the syringe without attempting to leave the hub attached to the syringe. Next, separate the needle from the small metal hub using an instrument to hold the hub. This is hard to do while the hub is loosely attached to the syringe barrel, but very easy once they are separated. The hub can then be replaced on the syringe. Of six recent needle sticks at our institution, one occurred when a student wrestling with this situation accidentally uncapped a used needle and then stuck his finger while trying to replace the cap.

Some dental needles have a fairly soft plastic hub, and these are easier to unscrew from the syringe. Others are made of a stiffer, tighter plastic and are more difficult to remove. Some practitioners have advised grasping the plastic hub of a needle with a hemostat or fingers and bending it at 90˚ from the syringe to remove the needle without unscrewing it. This serves no purpose and should not be done. While the maneuver may be successful (but still risky) with the softer plastic hubs, it requires too much force on needles which have stiffer plastic hubs. As a result, it becomes easy to accidentally uncap the needle, or to force the needle off the syringe, but overcompensate and drive the unprotected back end of the needle into one of the fingers holding the syringe. Two of six recent needle stick injuries were the result of attempting this maneuver and accidentally uncapping the used needle, then sticking a finger in the opposite hand.

Finally, it is unnecessary and dangerous to recap the back end of the needle before discarding it into the sharps container. The original cap was not designed to be replaced, is not retentive, and is easily penetrated by even a slightly bent needle. The best way to handle the used needle is to place it immediately into the sharps container once it is removed from the syringe (or syringe hub). One needle stick at our institution was the result of assuming the recapped back end was safe, and then sticking a finger on it after the cap fell off. Another occurred when the back of the needle, which was slightly bent after removing the needle from the syringe, passed through the cap and into the student's finger.

In the three months since publishing these recommendations, we have not seen any additional needle stick injuries involving local anesthesia needles. It seems, at least in the short term, that the intervention resulting from our blood and body fluid protocol and continuous quality improvement surveillance have helped reduce the incidence of preventable accidents. I pass these suggestions on to you with the hope that they might serve others equally well.