

Rhino Conditioned blood draw at the Tulsa Zoo: by Mike Connelly

By now, many of us know the value of being able to obtain blood samples from the animals we care for. The ability to obtain blood samples from animals without the need for sedation is even more valuable and is becoming more and more common with animals that are more challenging to sedate. Here at the Tulsa Zoo, we have been fortunate enough to obtain blood samples from our 1.1 rhinos for approximately the past 10 years. This ability first surfaced when we were presented with a research protocol seeking blood samples from our two rhinos. Staff immediately began brainstorming on how to condition our rhinos for blood sampling and below is a general outline on how we accomplished this.

First we needed to decide where we were going to draw blood from and where we were going to attempt the blood draws. After discussion with our veterinary services department, we decided we would target ear veins with our rhinos. Our facility is dated and does not allow for a great deal of flexibility and access to ears was generally easier than the legs. Not to mention, the ears were usually a bit cleaner. Therefore, we decided to initially condition this behavior in the rhino's regular indoor stalls with them either presenting their heads through the bollards or perpendicular adjacent to horizontal pipes. Every rhino is different but ours are fairly calm and cooperative overall and take most of what we present to them in stride.



Next we needed to determine what supplies were needed. Since many of us had familiarity drawing elephant blood, we adopted a similar approach. Our list of needed materials included, 4x4 gauze, dilute chlorhexidine, collection vials, syringes, and 23 gauge butterfly needles with catheter tubing. Combine this with a dedicated and patient staff and forgiving patients, we were ready to proceed.

After deciding where and with what, we needed to focus our attention on the how. Again, we adopted a similar approach as to our elephants since we also use ear veins on two of our three elephants. We began by getting our rhinos to respond to their names and station in a specific area. Once they were in the desired location, we hand fed them their regular daily diet of Mazuri ADF-16. Soon thereafter, we began working in a second person whose role would be to desensitize the rhinos to having their ears touched and manipulated. This step took a while as the rhinos required some time getting use to having their ears messed with. Throughout the process we more or less utilized continuous reinforcement in the form of their grain for them accepting tactile desensitization. At this point in time, we took the opportunity to clean/wipe down their ears with dilute chlorhexidine. It was our experience that once the rhinos began eating, they became focused on their grain and more accepting of additional steps as we progressed.

Once the rhinos accepted tactile desensitization and manipulation of their ears, we began applying increased levels of pressure to the ear doing our best to holding off the vein in question. Soon thereafter we began pinching and pricking the ear with fingernails and introducing minor levels of discomfort doing our best to mimic sticking them with a butterfly needle. We were especially careful to minimize any unnecessary accessories like the catheter tubing from touching their ears as this would often cause them to fling their ears. Surprisingly we found that our rhinos progressed through the blood draw process fairly rapidly and were quite forgiving. As you can imagine, the first several days that initial sticks were made, they did react negatively (changing position/posture, flinging ears, leaving station) but after a few incidents of this nature they began accepting needle insertion as well as could be expected.



Multiple sticks and repositioning of the needle were kept to a minimum. We are proud to say that to this day, we continue to obtain routine blood samples from Buzbie and Jeannie and that the entire team can successfully obtain blood from them. During periods of extreme cold, it has been challenging to get blood from their ears as the veins are not as obvious. It has also been problematic for this behavior to be passed on to others outside the pachyderm team, such as the veterinarian department, due to less familiarity with the rhinos.

With behaviors of this nature, safety for the animals and the staff are paramount. We pay close attention to any changes in body language and listen acutely for any sounds of frustration/anxiousness from the rhinos. Both are usually precursors to any charges and changes in body positioning, etc. We also always utilize two staff when drawing blood and know our escape routes. We always have a vertical pipe between us and the rhino's horn just in case they choose to turn on the person drawing the blood. We also try to set them and us up for success. As mentioned earlier, we try to keep this behavior strong and established with those who know the animals best as well as who the animals know best. Also, if a vein is not noticeable or we are not able to get a vein to stand up, we do not attempt drawing blood and instead wait until another date and time.

Successfully drawing blood from our rhinos has been a great husbandry component of rhino management. On multiple occasions we have sent blood away when our rhinos were acting "off". We routinely collect blood from our rhinos for banking purposes and our veterinary services department analyzes samples at least twice per year. We have also been able to participate in any and all research related to rhinos requesting blood. Conditioned blood draws are also great behaviors to help build rapport between rhinos and staff as well as boosting confidence levels with staff when they are able to reach milestones such as this with the animals they care for. Buzbie and Jeannie have and continue to teach us a lot and we are thankful for the opportunities they provide us with.



1.1 Southern White Rhino Training Protocol -- Voluntary blood collection from inner front leg without a chute - by Carly Barron, Maryland Zoo

Number of trainers: 2

2° trainer: Veterinarian

Bridge: Clicker

Reinforcers: Alfalfa cubes, hay, tactile (brushing, horn filing)

Training Materials: bucket (with nolvasan solution), sponge, blunt needle, target, clicker, alfalfa cubes, brush, file/rasp

Medical Materials: 21 3/4 gauge butterfly needle, 5-8 collection tubes, dilute nolvasan solution

1. Use "target" and "move up" (hand target) behaviors to position rhino parallel to pen bars with left side to bars.
2. Use "target" and "move up" to encourage rhino to position front left leg ahead of front right (allowing for access to inner front right leg.)
3. Utilize "steady" behavior to keep rhino still throughout collection.
4. Begin desensitization process with 1° trainer at head and 2° trainer at front legs. Position rhino properly at pen bars with all materials in place in keeper aisle way. Repeat throughout multiple sessions until positioning reliably.
5. With 1° trainer at head keeping animal still*, 2° trainer begins desensitization to washing leg with sponge and nolvasan solution. 1° trainer reinforces rhino for standing still (no steps backward or forward or breaking away from session.)
6. Over subsequent sessions, 2° trainer begins lightly poking inner right leg with finger(s), feeling for vein.
7. Using small approximations over multiple sessions, light finger palpations gradually increase to a single centralized, forceful finger poke. 1° trainer reinforces rhino for remaining still.
8. Once comfortable with previous step, begin to follow finger palpation (to find vein and best spot for collection) with light blunt needle pokes (replacing single finger poke), building up over multiple sessions to hard sticks reminiscent of real stick. 1° trainer continues to reinforce non-movement.
9. Once rhino consistently remains steady for fake sticks with blunt needle, blood collection is attempted using butterfly needle.
10. Final behavior consists of the rhino standing still for washing of the inner front right leg with sponge and nolvasan solution, feeling for best collection site with finger, and collection using butterfly needle.

