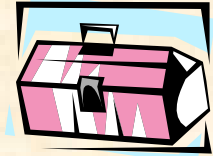


2011 Rhino Keeper Workshop Immobilization Summary: Wendy Shaffstall

RHINOCEROS IMMOBILIZATION DATA

Information was garnered from 2011 Rhino Keeper Workshop working group discussions and is generalized for all species, unless otherwise noted.

Preparation for procedure:



General supplies needed:

Thick cotton rope	Rubber mats	Sand bags/inner tubes
Straps/fire hose	Come-a-longs	Towels/blankets
Trash bucket	Extension cords	Supplemental lighting
Binoculars	Tool box w/pliers, etc.	Hay/straw bales
Hoof trimming supplies	Water bucket	Flashlight
Wood wedge for teeth	Cattle prod	Ultrasound machine
Cotton/Fabric ear	First aid kit	Leather gloves
Vehicle (go run to get additional supplies and/or equipment)		
Push boards for directing animal if immobilization is to take place in larger space		

Suggestion of weather dependent supplies:

Portable fans

Ice

Readily available water source with hose

Tarp or Portable shade structure

Supplemental heat

Due to possible extenuating circumstances should have the following readily/quickly available:

Welder

Chainsaw

Forklift-backhoe

Portable generator



Planning meeting :

Should be attended by participating personnel (veterinary staff, veterinary technicians, curators, keeper staff, and a maintenance staff person)

Topics to be discussed:

- 1) Barring emergency circumstances, where will immobilization take place (inside pen , outside holding area, on exhibit, in the field, etc.)?
- 2) What procedure(s) will be taking place (foot work, wound treatment, reproductive assessment, etc.)?
- 3) Does any equipment need to be in place prior to the procedure for desensitization?
- 4) Will this be standing, or full, immobilization /
- 5) Preferred recumbence if full immobilization (lateral versus sternal?)
- 6) What time will procedure begin?
- 7) Estimate of time required for specified procedure?
- 8) What elective procedure(s) might be completed, as time allows?

9) Delegation of responsibility:

Who is person in charge during the procedure

What keeper (probably accompanied by a veterinary staff member to record relevant time parameters) will monitor animal after narcotics are administered?

Who makes decision regarding presence of excessive and/or unnecessary personnel?

Who is person responsible for employee transport in case of emergency?

What is each individual person's responsibility?

If immobilization is to take place on exhibit (or in view of public) who will be responsible for crowd control and interacting with visitors? If it will involve another department, be sure to include them in planning meeting so their role is established, clearly defined and they are knowledgeable about information they are permitted to convey to the visitors.

**10) Chemical agents:**

Will pre-sedation with oral medication be done?

Safety protocol to be followed (drug handling, reversal agent, needle/syringe disposal)

Administration: hand injection versus darting

How injection site will be identified/marked to avoid direct contact

Gloves (required or not?)

11) Contingency plan for emergency:

Procedures to follow in person comes into contact with opioid

What developments might dictate rapid reversal of animal

Staff escape routes

Rapid equipment removal plan

12) Extenuating circumstances to consider :

For example – if female is still nursing s calf, need to address:

Will timing of procedure enable staff to condition calf for routine separation prior to procedure?

When should calf be separated from dam (if not part of a routine process)?

When, and how, should calf be re-united with dam?

Where is calf going to be located, so it will avoid stimulating female with vocalizations, etc.

13) Dietary restrictions:

Example of restrictions that could be implemented, but each institution will have their own criteria based on veterinary recommendation and/or procedurally dependent circumstances:

Withhold grain ration 48 hours prior to procedure

Withhold hay ration 24 hours prior to procedure

Remove water source 12 hours prior to procedure

Need to clearly delineate where non-animal personnel (students, veterinary interns, media, public relations persons, etc.) are permitted to be during procedure and knowledge of safety protocol in case an emergency situation arises.

14) Pen preparation:

Remove toys from area

Remove salt blocks

Remove logs or branches

May need to cover bars (either with padding or plywood) to deter horn from getting caught in between them – consideration to discuss in planning meeting and installation should be done in advance for desensitization

Put in some mats in preparation for immobilization, additional ones can be left outside pen for use during procedure

Use hay/straw bales to block corners and/or put in water trough to avoid entanglement

Drain water trough (at pre-determined time)

Induction



A) Chemical agents

- Pre- sedation being done? (see planning meeting discussion point)
- Administered intramuscularly (IM) via dart or hand injection
- Each veterinarian and/or institution may have a specific “cocktail” of narcotics they prefer to use
- Some agents commonly used are Etorphine (“M99”), Detomidine (“Dormosedan”), and Butorphenol
- After injection, ambient lighting and environmental noise should be reduced since it could inadvertently stimulate the animal
- Most narcotics used have reversal compounds (such as Naltrexone)
- **Supplemental drugs may be administered if:**
 - ◇ Need to increase recumbancy
 - ◇ If animal needs slight suppression of movement
 - ◇ Require more muscular relaxation
 - ◇ Animal appears to be progressing towards a lighter plane of anesthesia than what is desired
 - ◇ Generally will see onset of symptoms in 5 – 10 minutes and in 15 – 20 will see full effect.

B) Behaviors that may be seen:

- Bumping into walls due the reduction in visual acuity and spatial awareness
- General disorientation
- Head pressing
- High or exaggerated stepping
- Stumbling
- Pacing or walking in an attempt to “fight” narcotic effect
- Explosive exhalation



C) Circumstances to try and avoid:

- Excessive movement in the animal area until animal is fully under anesthetic effect and eyes are covered (towel or hood)
- Try not to make unnecessary noise in the animal area, wait until ears are plugged before bringing in additional personnel or moving in any equipment
- Unnecessary conversation

Procedure

- Pen should be already prepared, but additional mats and/or hay/straw bales can be outside the pen in case they are needed
- Make sure eyes are covered and ears plugged once animal is recumbent
- Depending on procedure, animal re-positioning may be required (come-a-longs, ropes, straps, etc.)
- Try to have additional padding or inner tubes to reduce pressure on shoulder, etc.
- Sand bags or inner tubes can be used to elevate head slightly to avoid potential eye abrasion on substrate
- Will generally have oxygen tube placed in nostril, will probably have pulse oximeter (on ear of caudal fold of tail, eye lid, etc.), heart and breathing rate monitored, IV line established and rectal thermometer (normal 98°) taken before any procedures are initiated.
- Staff may need to routinely massage legs every 20 minutes to ensure sufficient circulation
- A lighter plane of anesthesia could be indicated by seeing animal wiggling ear, wagging tail, legs twitching/pulling
- Conversation should be limited to avoid over-stimulating the animal.

Reversal

- Remove any ropes or straps that may be on animal
- Remove inner tubes or sand bags under head
- Get all equipment and personnel out of the pen (and surrounding area) prior to administering any reversal agents.
- Replenish substrate, and clean area, if needed (blood can cause olfactory stimulation and potentially agitate the animal)
- Reduce ambient lighting again
- Set up any doors, gates, etc. that may have been re-configured temporarily for procedure
- Usually portion of reversal will be given intramuscularly (IM) and a portion given intravenously (IV)
- Make sure everyone and everything is secure prior to reversal agents being administered – clearly communicate with each other
- Extraneous personnel out of the area and only person(s) designated to monitor animal should remain and these individuals will remain quiet and somewhat stationary to avoid stimulating animal as it recovers
- Remove eye covering and ear plugs
- Usually will see an increase in breathing rate as first indication, then increase in body manipulation and finally standing up (generally within 10 minutes after reversal agents administered, but could take as long as 30 minutes)
- Let animal rest – don't try to accelerate movement or over stimulate it
- Don't plan on re-introducing calf until dam is fully awake and ambulatory



Recovery and monitoring

- Signs of re-narcotization can occur after effects of reversal antagonists wear off, should watch for:
- Pacing
- Excessive sleepiness
- Should not fall back to lateral recumbence
- Head pressing
- High or exaggerated stepping
- Monitoring by staff should be done for about an hour, then can be reduced in frequency and periodically for a minimum of 8 hours
- Veterinary staff should be updated on animal's status prior to keeper staff departure for the day
- Review follow up care and medication schedule (if needed) with veterinary staff
- Establish resumption of feeding regime – usually 8 hours post-procedure ½ normal hay ration can generally be given
- Establish when access to water can be given (free access or limited quantity)
- Grain ration feeding can usually resume the following day and full hay ration quantity can usually be fed.

