

# CHEMICAL IMMOBILIZATION – INDIVIDUAL SPECIES REQUIREMENTS

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## INTRODUCTION



**Figure 9.1:** White eared kob (*Kobus kob leucotis*) running as a herd in Boma-Jonglei, Republic of South Sudan. Males are chocolate brown with spiral horns, females light tan without horns. These antelope migrate over 1 500 km and number in the region of 850 000–900 000 – capture and restraint can be carried out by helicopter darting or ground netting.

There are two parts to the discussion of each individual species. The first covers a general description of the animal, its distribution, behaviour, preferred habitat and reproduction. This information is given to provide a background that will guide the approach and planning of the capture to be undertaken. The second part deals with the drugs and darting equipment to use, together with brief notes on what to expect from the effects of drugs on each individual species (see Chapters 10, 11 and 12 on dart equipment). All the doses given in the tables in this chapter are for adult males and females, unless indicated otherwise.

It is important for any person moving wildlife in Africa to familiarize themselves with regulations that control the movement of animals, the risks of spreading disease or which species occur naturally in order to conserve the genetic make-up of wildlife populations. The management, handling and anaesthesia of all species will vary, depending on whether the work is done under extensive or intensive conditions. This distinction is important to understand, to ensure that the correct approach to the management of the species is taken.



## 9.1 GENERAL CAPTURE INFORMATION ON UNGULATES

### 9.1.1 Pharmacological principles

- The objective for capturing the animal must be clear, as this could influence the drug combination and subsequent handling.
- The established opioids (etorphine and more recently thiafentanil) are the drugs of choice, and tranquilizers (especially azaperone), together with the absorption-enhancer hyaluronidase, are added to the opioid.
- Overdose with opioids rather than underdose.
- Doses supplied are total doses and not given on a weight-equivalent basis, unless indicated as such.
- The recommended drug combination is given first, with other alternatives given as second or third options.
- $\alpha$ -2 agonists can also be added to opioids in the dart but be aware of the significant physiological side effects that they could elicit (decreased thermoregulation, drop in blood pressure, increasing core blood pressure in others, worsening gaseous exchange and regurgitation). The addition of  $\alpha$ -2 agonists is not recommended on very young, old and debilitated animals. Medetomidine is the  $\alpha$ -agonist of choice, but should be reversed with atipamezole or at least yohimbine. Xylazine is a cheaper alternative but is less specific, and has longer lasting and greater side effects.
- The combination of butorphanol, azaperone and medetomidine (BAM) or midazolam is becoming more frequently used in smaller antelope and predators in southern Africa, as they are safe reversible alternatives to the established combinations.
- Instead of using opioids as a top-up, ketamine on its own can be used in all species, given as a 20–100 mg bolus dose depending on species. Its use is particularly recommended in roan, sable, gemsbok, buffalo, hippo and some predators.
- Midazolam and valium in boluses of 10–20 mg IV also have a good sedative effect, and are both safe and effective drugs to use. A combination of ketamine and midazolam can be given for animals that need additional control.
- Note that animals can recover spontaneously from the effects of reversible anaesthetic combinations without the administration of the reversing drugs, usually within the first hour of immobilization.
- In general, take particular care in the use of reversible combinations in old, sick or debilitated animals, as these often contain sedatives or  $\alpha$ -2 agonists, which can induce profound effects in such animals.
- Antidotes are given at 2–2,5 x the opioid dose for diprenorphine and 10–20 x the opioid dose for naltrexone. Although naltrexone is the recommended antidote for thiafenatanil, diprenorphine can be used, especially if the animals are in bomas or need to be transported – they will be slightly subdued compared to those given naltrexone reversal.
- Diprenorphine is the recommended drug for reversal when the animal is loaded for transport or in confined areas. Here it can be easily monitored for renarcotization. However, naltrexone is recommended for free-release situations, where the animals cannot easily be monitored and are potentially exposed to predation or social aggression in the same or other species.
- For animals that react badly to opioids or have potentially been overdosed, administer naltrexone at 20–50 x the opioid dose to revive them fully and to avoid post reversal renarcotization.
- Partial reversal can usually be achieved in animals that need stimulation, partial revival or walking by giving 10–30 mg nalorphine or butorphanol in increments of 5 mg (larger animals) or 2,5 mg (for calves or smaller animals). If only diprenorphine is available, then a dose of 0,5 mg to a maximum of 1,5 mg can be used IV or up to 5 mg IM.

water and can be remotely triggered to close the two open sides. The hippo is then loaded out of the capture pen into trucks. This allows for capture of hippo in good condition, as they are not forced to be confined in a small area where they are getting suboptimal nutrition, and therefore post-release mortality can be reduced.



Beware of hippo that appear asleep but suddenly wake up with stimulation. They bite quickly – never approach a hippo from the front!

Hippo can be captured using a net-gun (P. Morkel, pers. comm.).

Tranquillization using 200–300 mg azaperone given IM during transportation is effective in hippo.

### 9.4.3 WHITE or SQUARE-LIPPED RHINOCEROS (*Ceratotherium simum*)



The white rhino is a grazer and has a square lip, which enables it to graze efficiently. The black rhino has a pointed prehensile lip to be able to browse on leaves, fruits and twigs. The white rhino is considerably larger than its black relative, has a hump on its neck and on its back in front of the hindquarters, both of which are not seen in black rhino. Apart from the anatomical differences, these animals differ in their responses to capture and handling. The white rhino is approachable when free-ranging. In contrast, the black rhino is well known for its aggressive nature, which results in it being more likely to seek and destroy the source of its pain when darted. Once these two species are captured, however, their temperament changes. White rhino become aggressive and more dangerous in captivity, until they calm down a number of weeks after being placed in captivity. It is rare that an adult white rhino taken out of the wild will allow touching or feeding by hand. However, black rhino placed into captivity generally calm down quickly and start feeding within 2–3 days. Wild, free-ranging black rhino can be very aggressive initially in a boma – this varies from individual to individual. Black rhino need much more individual and specific management compared to white rhino, which are much more predictable once settled.

White rhino often take up to 12 days to eat properly and some have to be released because they do not settle or eat at all. Black rhino quickly settle into a routine and can be easily managed within a week after