

# ALTERNATIVE DRUG COMBINATIONS FOR ANAESTHESIA IN GAZELLE SPECIES - EXPERIENCE AT THE BCEAW, SHARJAH, UAE

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With the right handling techniques, experience and appropriate capture systems, many non painful procedures such as blood sampling and vaccination can, and should, be performed without the need for anaesthesia. There are, however, circumstances where the animals need to be immobilised to be caught or where animals need to be under anaesthesia to perform surgeries.

Combinations with potent opioids such as etorphine (M99) are commonly used in the region because of their fast induction and the small volumes required for darting. They have, however, several disadvantages. Hyperthermia, exertional myopathy, apnoe, poor oxygenation and renarcotisation are common side effects seen. They are also highly dangerous to people via resorption through the skin or mucosa. As they are very potent drugs which are government regulated in many countries, they are often not legally available.

We therefore started a trial at the Breeding Centre for Endangered Arabian Wildlife (BCEAW), Sharjah, UAE, using alternative drug combinations with alpha-2 adrenergic antagonists. The drugs were used in Rheem gazelle (*Gazella subgutturosa marica*), Arabian mountain gazelle (*Gazella gazella cora*) and Dorcas gazelle (*Gazella dorcas*).

The following combinations were trialled.

### Medetomidine + ketamine

Although this is a safe combination, widely used in many different species, we often saw prolonged induction times in the gazelle, and an unpredictable plane of anaesthesia varying from very light sedation to moderate anaesthesia. This combination is less suitable for darting where a quick induction is preferred, but can be used in a controlled environment. Atipamezole intramuscular (IM) at 5mg per 1 mg medetomidine given, was used for reversal and resulted in smooth recoveries.

### Medetomidine + ketamine + butorphanol

A better plane of anaesthesia was reached when butorphanol was added to this combination. This results, however, in large volumes making darting difficult. More concentrated medetomidine (10mg/ml) and butorphanol (50mg/ml) can be used, significantly reducing the volumes required. Alternatively (demetomidine 10mg/ml) was used to replace the medetomidine, at the same dosage, with a similar effect. Most animals reached a plane of anaesthesia enough for capture and non-invasive procedures, but required additional drugs for intubation or surgery. The higher range of dosages was usually needed to achieve adequate anaesthesia. Atipamezole was given to antagonise the medetomidine. Although the butorphanol was not antagonised, the animals recovered quickly after administration of atipamezole IM.

### Zolazepam/tiletamine (Zoletil ®) + medetomidine

This combination has the advantage that it gives a fast induction, and that small volumes are used which makes it useful for darting. However, some animals showed signs of disorientation resulting in falling down and trying to get up again during induction. Atipamezole was given to antagonise the medetomidine. Again, although this was only a partial reversal for the drugs used, recovery was smooth.

Decreased respiration and heart rates were noticed with all combinations. Also blood oxygenation was reduced, but this was compensated for by supplementing oxygen by mask. These effects can be related to the use of the alpha 2 adrenergic antagonist.



Fig 1. Arabian gazelle in flight mode



Fig 2. Intubation of an Arabian gazelle to facilitate additional anaesthesia.

Anaesthesia in gazelles can be a frustrating undertaking as they are nervous and flighty animals (Fig 1). The dosage range needed does not only depend on the species but also on a range of other factors and circumstances such as the individual temperament, general condition, the degree of habituation, the environment where the capture takes place, and the animal's position in a group's hierarchy. Gazelles often mask underlying disease and carrying out a general examination or obtaining diagnostic blood work pre-immobilization is usually not feasible. If animals have an individual identification number (ear tags or ear notching), specific information such as the general body condition and any previous diseases or interventions should be recorded in detail. The collection of accurate weights at every opportunity will help to calculate accurate dosages and avoid over- or under-dosing.

In most cases additional anaesthetics are required after the use of injectable drugs before intubation (Fig 2) or before surgeries can be carried out. Most commonly ketamine IV or isoflurane by mask are used to deepen the anaesthesia. Local anaesthetics can also be utilised for example to perform a caesarean.

It is important to note that when alpha-2 adrenergic antagonist drug combinations are used, patience is required. One needs to allow the animal enough time after injection and the gazelle should not be approached too soon to avoid arousal. This can take between 10 to 20 minutes.

Our trial showed that several alternative drug combinations to opioids can be used in gazelle with good success but that no anaesthesia in gazelle is ever the same. In comparison to many other species, effects can depend highly on circumstances. Under-dosed animals pose a risk to themselves and to handlers, while over-dosing can result in anaesthetic deaths. Any of the drugs mentioned should only be used by people with the appropriate training and medical knowledge, who can adapt dosages according to requirement in a given situation for a given individual.

Table 1: Dosages

Drugs	Dosage (all injected intramuscular)
Medetomidine + Ketamine	0.05mg/kg (M) + 4mg/kg (K)
Medetomidine + Ketamine + Butorphanol	0.05-0.07mg/kg (M) + 3-4mg/kg (K) + 0.3-0.4mg/kg (B)
Medetomidine + Zolazepam/Tiletamine	0.04-0.05mg/kg (M) + 4-5mg/kg
Atipamezole (as reversal)	5mg per 1 mg medetomidine given