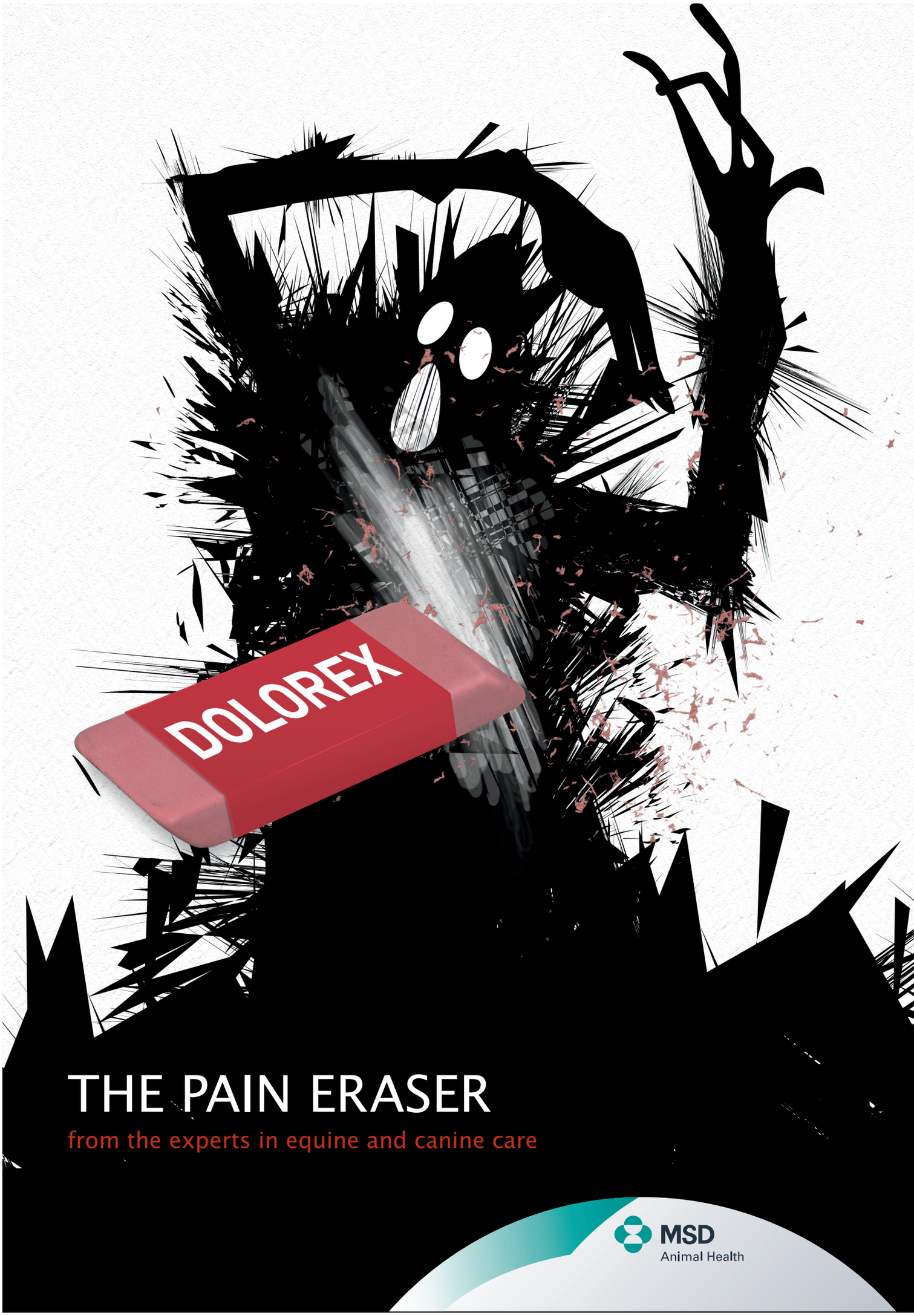


THE PAIN ERASER

from the experts in equine and canine care

MSD
Animal Health

WHEN ANIMAL PAIN ISN'T EFFECTIVELY MANAGED, IT'S YOUR PRACTICE THAT HURTS

Practically since the beginning of recorded history there has been a debate regarding animal pain. An era in which the vast majority of professionals accept the necessity of good pain management, evaluations can differ widely regarding the quality and intensity of pain. Misjudging pain, or failing to anticipate it properly, can affect the animal's comfort, wellbeing and even recovery. Inadequate treatment of pain can also create situations in which both the patient's and the caregiver's safety is compromised. Your clients trust you to take into account their animal's best welfare. Providing effective pain management you fulfill an important dimension of that obligation.

VISUALIZING ANIMAL PAIN

While veterinarians look for certainty in every diagnosis they make, detecting pain in animals can be a kind of guessing game. It could be said that pain assessment is as much a part of the art of being a good veterinarian as it is the science. Without the advantage of patient self-assessments, the veterinarian is left to infer the presence of the pain and its intensity. Doing so accurately, visualizing the pain and anticipating the right pain management response, has become an essential part of the veterinary practioner's art.

COLIC PAIN

Originating from the abdominal cavity, colic is the most common emergency in equine medicine. Clinical signs arise due to partial or total obstruction, inflammation or changes in gastro-intestinal motility of the small and large intestine. Around 2-6% of colic cases require surgery while most cases respond to conservative management. Due to the sometimes violent nature of the horse in pain, pain control is a priority for a proper diagnosis and treatment.

VISCERAL PAIN

Pain is unpleasant but inevitable. In dogs it should be prevented and controlled whenever possible. Pain associated with soft internal organs or viscera is known as visceral pain. This type of pain arises when the internal organs are damaged or injured. Visceral pain is common and can be mild to severe, stemming with causes ranging from simple indigestion to surgery. This dull, constantly aching pain responds best to narcotic type analgesics (opioid analgesics, opiates). The use of analgesics in dogs by veterinarians is still limited but is growing. Alleviating pain is an important way to improve the welfare of dogs.

PAIN AND DISCOMFORT DURING INTERVENTIONS

The use of a major tranquilizer (neuroleptic) with an opioid analgesic can be used to produce neuroleptanalgesia, a state of psychic indifference to environmental stimuli, without loss of consciousness.

In horses. Neuroleptanalgesia is used to provide sedation and analgesia, when it is not possible or advisable to completely anesthetize the patient, neuroleptanalgesia can be used to sedate the horse, making it oblivious to pain while still standing.

In dogs. Neuroleptanalgesia is one of the most common methods of sedation for performing minor procedures and to avoid stress and struggling. Neuroleptanalgesia is also commonly used in dogs prior to a general anesthetic to reduce stress, contribute to the analgesic effect and reduce the dose of anesthetic required.

SAFE AND EFFECTIVE IN HORSES

"Dolorex is effective in the treatment of colic pain yet does not have an undesirable effect on gut motility."

HOW WAS IT STUDIED?

A study[1] was undertaken in six healthy 6-8 month-old horses. They were surgically prepared with electrodes attached to the gastric antrum and duodenum. Antroduodenal myoelectrical activity was recorded following intravenous injection of 0.05 mg/kg bodyweight of Dolorex (butorphanol).

WHAT WAS FOUND?

Treatment was followed within 2 to 3 minutes. by a normal appearing period ofthe contractions of the gut. This was followed by a period of no contractions and then resumption of contraction of normal duration.

WHAT WAS CONCLUDED?

A dose of Dolorex that has effective analgesic effects in a colicky horse resets the antroduodenal migrating motor complex without causing undesirable effects on antroduodenal motility.

"Cardio-respiratory change is one of the known effects of opioids in horses. A single intravenous dose of Dolorex shows no clinically significant cardio-respiratory modifications."

HOW WAS IT STUDIED?

A study[2] assessed the cardio-respiratory profile of butorphanol in six mixed-breed healthy horses, after a single intravenous administration at dose rates of 0.1, 0.2 and 0.4 mg/kg body weight with a washout period of at least 4 days between dosing. Haemodynamic and electrocardiographic measurements were taken and blood gases were measured before and up to one hour after Dolorex (butorphanol) administration.

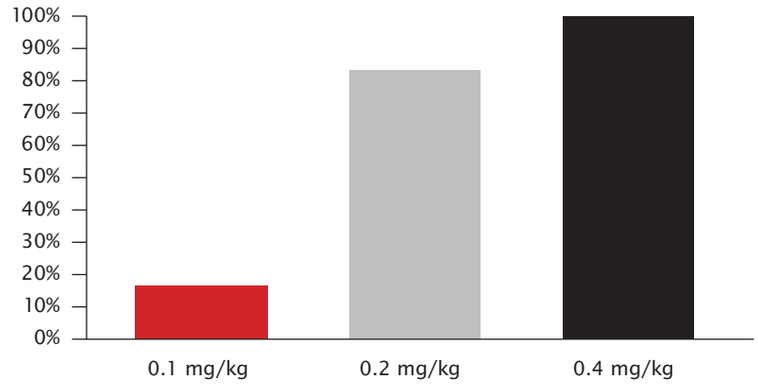
WHAT WAS FOUND?

Stable cardio-respiratory profile: cardiac output, mean central venous and diastolic pulmonary artery pressures, systolic, mean and diastolic aortic pressures, respiratory rate, arterial pH, pO_2 and pCO_2 remained within the reference ranges. Behavioral signs (excitement, head tossing) and locomotory changes (increased walking) were dose-dependent, in occurrence and intensity. The changes produced are known effects of opioids in horses.

WHAT WAS CONCLUDED?

A single dose of Dolorex is without clinically significant effects on the cardio-respiratory system.

DOSE-DEPENDENT CHANGES IN BEHAVIOR AND LOCOMOTOR ACTIVITY



EFFICACY IN COLIC

"Dolorex is the right choice in colic treatment. A study shows that Dolorex does not mask important signs. This leads to faster, and more accurate diagnosis."

HOW WAS IT STUDIED?

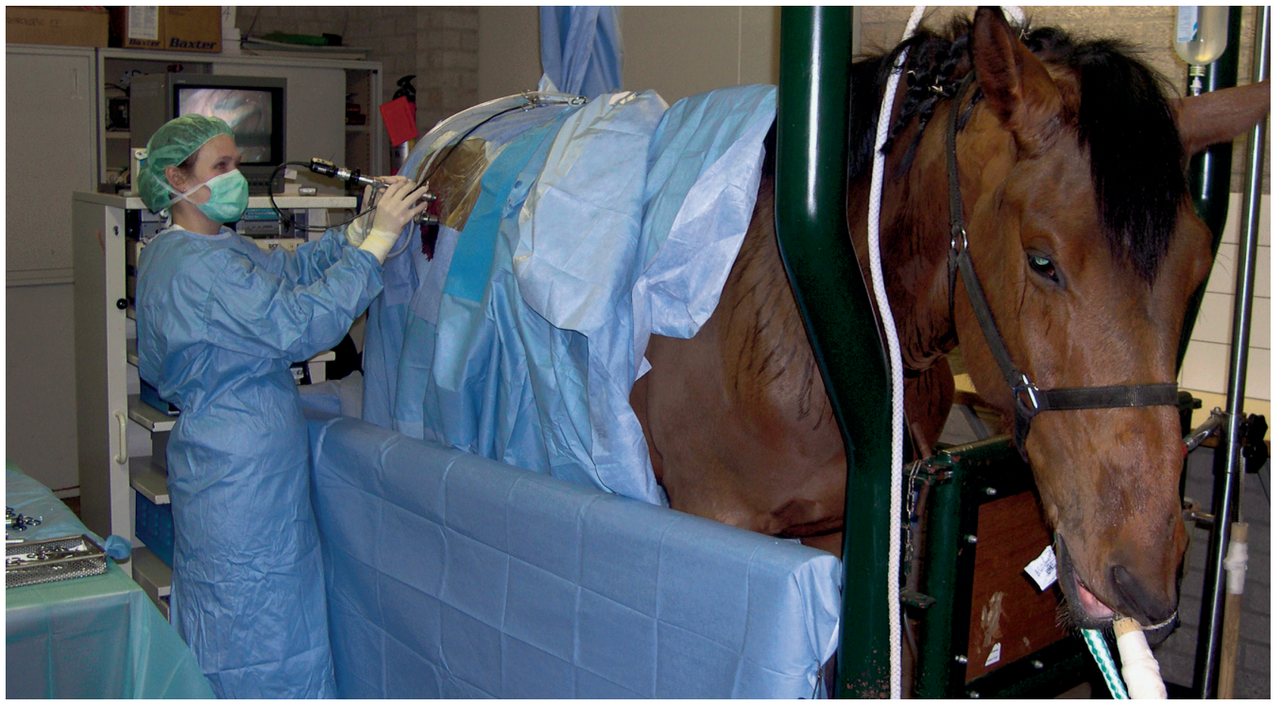
The study[3] compared visceral analgesic effects of xylazine, morphine, butorphanol, pentazocine, meperidine, dipyrone, cecal distention and flunixin in a model of colic pain.

WHAT WAS FOUND?

While xylazine produced the most relief from abdominal discomfort, repeated administration of xylazine may reduce visceral pain so effectively that the seriousness of colic is masked. Xylazine also decreased propulsive motility in the gut of healthy ponies. Other studies confirmed the findings that products such as xylazine are so potent they mask the signs of surgical colic. Both Dolorex (butorphanol), and morphine receive visceral pain in the cecal distention. Morphine may inhibit colonic motility, and butorphanol jejunal, motility. The development of altered behavior (i.e., apprehension and pawing) in horses given opiate therapy may limit their use in some cases, although these side effects are considered of minimum importance.

WHAT WAS CONCLUDED?

Dolorex is efficacious in colic pain and doesn't mask the signs so that a precise and fast diagnosis can be made.



EFFICACY IN NEUROLEPTANALGESIA

"A study determines that Dolorex, combined with detomidine, provides a safer, more appropriate solution for surgical procedures in standing horses."

HOW WAS IT STUDIED?

A study[4] of standing sedation was conducted in 22 horses (360 – 600 kg) undergoing laparascopic surgery (ovariectomy). The combination of detomidine (0.01 – 0.02 mg/kg intravenously) and butorphanol (0.01 – 0.02 mg/kg intravenously) was administered.

WHAT WAS FOUND?

The combination of detomidine and butorphanol provided adequate sedation for the procedure. Minor complications were associated with the procedure rather than the sedative combination used. No major operative or postoperative complications occurred. Owner satisfaction and cosmetic results were considered excellent.

Similar results were shown in another study[5] using detomidine (0.01 mg/kg intravenously) and butorphanol (0.01 mg/kg intravenously) in combination for standing sedation of five horses for laprascopic surgery.

WHAT WAS CONCLUDED?

Detomidine in combination with butorphanol provides adequate sedation and analgesia for standing surgery.

A SAFE AND EFFECTIVE ANALGESIA IN DOGS

"The high safety margin of Dolorex relative to other opioids means that the restrictions on its use are fewer."

HOW WAS IT STUDIED?

A study[6] evaluated the effects of butorphanol given intravenously at dose rates of 0.1 and 0.4 mg/kg in conscious dogs, 5 dogs at each dose.

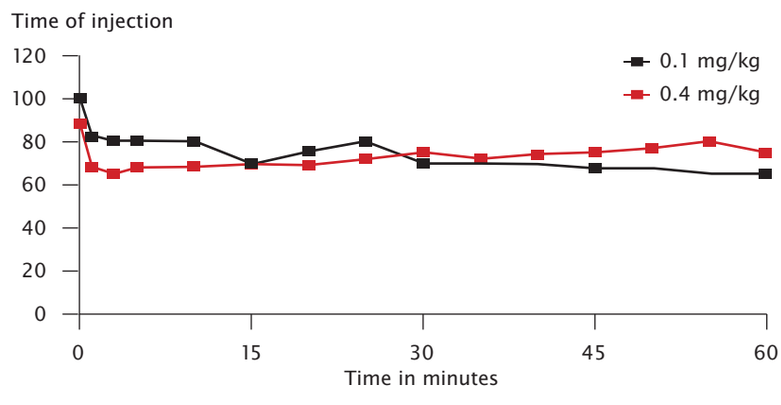
WHAT WAS FOUND?

Mild sedation occurred, though it was greater in dogs given the higher dose. Two dogs in each group panted, but blood carbon dioxide ($PaCO_2$) was not significantly changed. There were small but statistically significant decreases in arterial blood pressure, heart rate (see chart), and blood oxygen (PaO_2) occurred.

WHAT WAS CONCLUDED?

Dolorex has only mild sedative effects at doses used clinically. Cardiovascular and respiratory depression were minimum Dolorex has a good safety profile even at the high end of the dosage range.

MEAN HEART RATE IN DOGS GIVEN BUTORPHANOL AT TWO DIFFERENT DOSE RATES



EFFICACY IN DOGS

"Dolorex is just as efficacious as a butorphanol-meloxicam combination at relevent time-points in a study of perioperative pain management."

HOW WAS IT STUDIED?

A study[7] was undertaken of 40 client-owned dogs undergoing surgical repair of the cranial cruciate ligament following spontaneous rupture. One group of dogs were administered butorphanol (0.2 mg/kg intravenously) and the NSAID meloxicam (0.2 mg/kg intravenously) just before surgery. A second group of dogs received butorphanol only (0.2 mg/kg intravenously just prior to surgery and a top-up dose of 0.1 mg/kg intravenously at incision closure. Pain was assessed using a number of subjective pain assessment scoring tools including the adjusted modified cumulative pain score (AMCPS), which includes signs of pain such as movement, localization and agitation, and is adjusted for baseline. Baseline values were established before surgery and assessments made at regular time points after surgery.

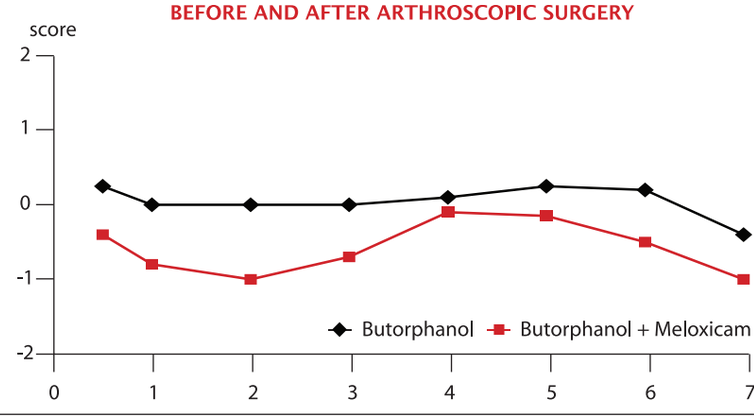
WHAT WAS FOUND?

There were no significant differences between treatment groups. AMCPS was not significantly different between the two groups of dogs up to 8 hours following extubation. At 8, 9, 10, and 11 hours after extubation, meloxicam plus butorphanol-treated dogs had a significantly lower AMCPS, compared with dogs treated with butorphanol alone.

WHAT WAS CONCLUDED?

Dolorex provides effective short duration analgesia in dogs

MEAN ADJUSTED MODIFIED CUMULATIVE PAIN SCORES IN DOGS BEFORE AND AFTER ARTHROSCOPIC SURGERY



DOLOREX ERASES PAIN WHILE DELIVERING THESE POWERFUL ADVANTAGES

POTENT

- Effective in moderate to severe pain (particularly of visceral origin)
- Sedation in dogs (central action)
- Better pain relief by treating pain before it occurs (e.g. surgery)
- Rapid results

SAFE

- Fewer side effects
- Less sedative effect than other opioids
- Lowers the dose when used in combination with alpha2 agonist
- Repeat use possible

CONVENIENT

- Can be used intramuscularly or intravenously
- Two presentations available
- Registered for dogs and horses
- Can be used with alpha2 agonist (e.g. medetomidine or romifidine)

COMBINATION	RECOMMENDED DOSE	100 KG HORSE	600 KG HORSE
Detomidine +	0.01 – 0.02 mg/kg IV	0.1 – 0.2 ml	0.6 – 1.2 ml
Dolorex*)	0.01 – 0.02 mg/kg IV	0.1 – 0.2 ml	0.6 – 1.2 ml
Romifidine+	0.05 mg/kg IM	0.5 ml	3 ml
Dolorex#)	0.02 mg/kg IM	0.2 ml	1.2 ml

*) Detomidine should be administered up to 5 min. before Dolorex

#) Romifidine should be administered concurrently with Dolorex, or 4 minutes before.

COMBINATION	RECOMMENDED DOSE	10 KG DOG	20 KG DOG
Medetomidine +	0.01 – 0.03 mg/kg IM	0.1 – 0.3 ml	0.2 – 0.6 ml
Butorphanol*)	0.1 – 0.2 mg/kg IM	0.1 – 0.2 ml	0.2 – 0.4 ml

*) Medetomidine and Dolorex can be administered concurrently


DOLOREX

DESCRIPTION
Dolorex also known as Dolorex vet (SE, NO) and Butordol (ES, FI). Each ml contains Butorphanol 10 mg (equivalent to butorphanol tartrate 14.6 mg).

FORMULATION
Aqueous colourless solution for injection.

TARGET SPECIES
Horse, Dog INDICATIONS Butorphanol is intended for use where short duration analgesia is required. For information on the duration of analgesia that can be expected following treatment. Horse: For relief of pain associated with colic of gastrointestinal tract origin and for sedation in combination with certain alpha2 agonists. Dog: For relief of moderate visceral pain and for sedation in combination with certain alpha2 agonists.

DOSAGE AND ADMINISTRATION ROUTE - FOR ANALGESIA
Horse: 0.05-0.1 mg/kg, intravenously Dog: 0.2-0.4 mg/kg, intravenously. Rapid intravenous injection should be avoided. Butorphanol is intended for use where short duration analgesia is required. Analgesia generally occurs within 15 minutes following intravenous administration. After a single intravenous dose in the horse, analgesia usually lasts for 15-60 minutes. In the dog, it lasts for 15-30 minutes after a single intravenous administration. Repeat treatments of butorphanol may be administered. The need for, and timing of repeat treatment will be based on clinical response. For cases where longer duration analgesia is likely to be required, an alternative therapeutic agent should be used.

FOR SEDATION
Butorphanol can be used in combination with an alpha2 agonist (e.g. (me)detomidine or romifidine). Adjustment of the dose will then be necessary according to the following recommendations: Horse: Detomidine 0.01-0.02 mg/kg intravenously up to 5 minutes before Butorphanol 0.01-0.02 mg/kg intravenously. Romifidine0.05 mg/kg intravenously concurrently or 4 minutes before Butorphanol 0.02 mg/kg intravenously. Dog: Medetomidine 0.01-0.03 mg/kg concurrently with Butorphanol 0.1-0.2 mg/kg intramuscularly.

PRESENTATION
10 ml and 50 ml glass vials.

CONTRA-INDICATIONS
Do not use in animal with a history of liver or kidney disease. Butorphanol/detomidine combination: should not be used in horses with a pre-existing cardiac dysrhythmia; will cause a reduction in gastrointestinal motility and consequently should not be used in cases of colic associated with impaction. Use of the product in foals and young puppies should be on the basis of a risk:benefit analysis. Horse: The use of the product at the recommended dose may lead to transient ataxia and/or excitement. Therefore, to prevent injuries in patient and people when treating horses, the location for the treatment should be chosen carefully Horse and dog: Due to its anti-tussive properties, butorphanol may lead to an accumulation of mucous in the respiratory tract. Therefore, in animals with respiratory diseases associated with increased mucous production or in animals that are being treated with expectorants, butorphanol should only be used on the basis of a risk-benefit analysis by the responsible veterinarian. Sedation may be noted in treated animals. The concomitant use of other central nervous depressants would be expected to potentiate the effects of butorphanol and such drugs should be used with caution. A reduced dose should be used when administering these agents concurrently. The combination of butorphanol and alpha2 agonists should be used with caution in animals with cardiovascular disease. The concurrent use of anticholinergic drugs, e.g atropine should be considered. Special precautions to be taken by the person administering the veterinary medicinal product to animals Precautions should be taken to avoid accidental injection/self injection. If accidental self-injection occurs, seek medical advice immediately and show the package insert or the label to the physician. Do not drive. The effects of butorphanol include sedation, dizziness and confusion. Effects can be reversed with an opioid antagonist. Wash splashes from skin and eyes immediately.

ADVERSE REACTIONS
Butorphanol may cause the following side effects: Horse: Excitatory locomotor effects (pacing); ataxia; reduction in gastrointestinal motility; depression of the cardiovascular system. Dog: Depression of the respiratory and cardiovascular system; anorexia and diarrhoea; reduction in gastrointestinal motility; local pain associated with intramuscular injection.

USE DURING PREGNANCY AND LACTATION
The safety of this veterinary medicinal product has not been established in the target species during pregnancy and lactation and is not recommended.

INTERACTIONS
Butorphanol may be used in combination with other sedatives such as alpha2 agonists where synergistic effects can be expected. An appropriate reduction in dose is necessary when used concomitantly with such agents. Because of its antagonist properties at the opiate mu receptor butorphanol may remove the analgesic effect in animals, which have already received pure opioid mu agonists.

WITHDRAWAL PERIOD(S)
Horse: Meat and offal 0 days; Milk 0 days

PHARMACEUTICAL PARTICULARS
Do not mix the product with other veterinary medicinal products. Use before the expiry date printed on the pack. Use within 28 days after first opening. Protect from light. Do not refrigerate or freeze.

KEEP OUT OF THE REACH OF CHILDREN

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